Alberta

MUNICIPAL AFFAIRS

Innovative Housing Grants Program

RENOVATIONS FOR A SENIOR'S HOME

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The views and conclusions expressed and the recommendations made in this report are entirely those of the authors and should not be construed as expressing the opinions of Alberta Municipal Affairs.

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FOREWORD

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EXECUTIVE SUMMARY

Objective

The objective of this report is to provide seniors, their spouses and families with design, technical and cost information to assist in purchasing home renovation services and equipment required to assist them to remain independent and secure in their homes.

Method

Material for this report has been gathered from interviews with many people expert in the needs of seniors for homecare and other support services, and from research into a number of reports on the design and planning for the residential needs of seniors and others with physical difficulties.

Using a variety of graphic illustrations as well as written text, the report addresses practical problems in design of home renovations for an increasing number of Alberta seniors who wish to better adapt their homes to their changing needs. The report (1) analyses the exterior of the home and suggests modifications to increase accessibility, convenience and protection of entrances and circulation areas from severe weather, (2) analyses the interior of the home and modifications which can increase its comfort, safety and security, (3) identifies design products and building materials and some estimated costs; (4) outlines practical procedures for execution of the work including design of renovations, construction contracting and legal approvals and (5) outlines a variety of Federal and Provincial programs which can be considered to assist efforts by individual seniors and their families to obtain needed changes to homes.

Key Issues

(1) Ambulant seniors can obtain most of the modifications which they require with little or no structural renovation to a home and at relatively low cost.

(2) Seniors who use wheelchairs or walkers require more complex and costly renovations to make their homes barrier-free and comfortable.

(3) For wheelchair users, low slope ramps offer the simplest low-cost arrangement. However, on small residential lots they use up much of the available land. Such ramps should have slopes as close to 1:20 as possible.

(4) Ramps are more difficult to protect from weather and can be only partly enclosed within a building such as a garage,

at some cost and loss of usable parking.

(5) In two or three storey homes passenger lifts, wheelchair lifts or residential elevators are essential to provide barrier-free access to all levels for people who cannot use stairs.

In most typical homes however, stairs are too steep to be used safely by seniors and too narrow to accommodate either a passenger or a wheelchair lift. Therefore, they must either be reconstructed or an alternative method must be found.

(6) Kitchens and bathrooms in typical homes may require costly and complex design changes to ensure access and independence by seniors.

(7) Doorways, interior hallways and bathrooms in typical homes can be enlarged to accommodate wheelchairs or walkers but at some cost and in some cases with a loss of usable storage or other space.

(8) Most changes to kitchens are relatively easy to achieve using standard design components. However, custom design arrangements are more expensive to provide.

(9) Most bathrooms in typical homes are too small to accommodate wheelchairs and walkers and may require significant modification in interior room arrangements to make them barrier-free. However, with modest changes of wall partitions and doors, small compact bathrooms can be enlarged to accommodate wheelchair dependent seniors.

CHAPTER 1

INTRODUCTION

D. Whiting and B. Woodward's 1985 report A Senior's Home: Designs for Independent Living addressed the problem of designing housing for the particular and changing needs of seniors. This report complements that work with a study of possible renovations to seniors' homes. It focuses in particular on adaptation which would enable physically impaired seniors to continue to live conveniently in their own homes in comfort and security. The report also discusses procedures to implement the needed structural changes to seniors' homes, and identifies the cost of products and selected design changes.

1.1 PURPOSE OF THE REPORT

This report presents cost-effective design concepts and construction methods, and illustrates how modifications or the addition of modest support equipment can give physically impaired seniors safer and more independent lifestyles.

The booklet is intended to suggest possibilities and to identify potential opportunities rather than prescribe specific changes and modifications. Although the plans and proposals are not applicable to every residence, the suggestions and illustrations are intended to present a range of alternatives possible for typical Alberta homes.

1.2 PROBLEM DEFINITION

As with other provinces in Canada, the proportion of senior citizens in Alberta is increasing. This growth is expected to continue for several decades. The majority of Alberta's seniors are retired, healthy and physically independent. Most live either alone or with spouses in single-detached homes in larger cities or towns. Most independent seniors live in bungalows.*

A great number of seniors live most of their adult lives in their own homes. Although most wish to continue to do so, their ability to cope with houses designed for the population at large decreases with age and physical limitations.

Two of the most common difficulties seniors experience are:

(1) walking or climbing stairs; and

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* E.A. Doherty et al, Residential Construction Practices in Alberta 1900-1971. Edmonton: Alberta Housing 1984, p.27

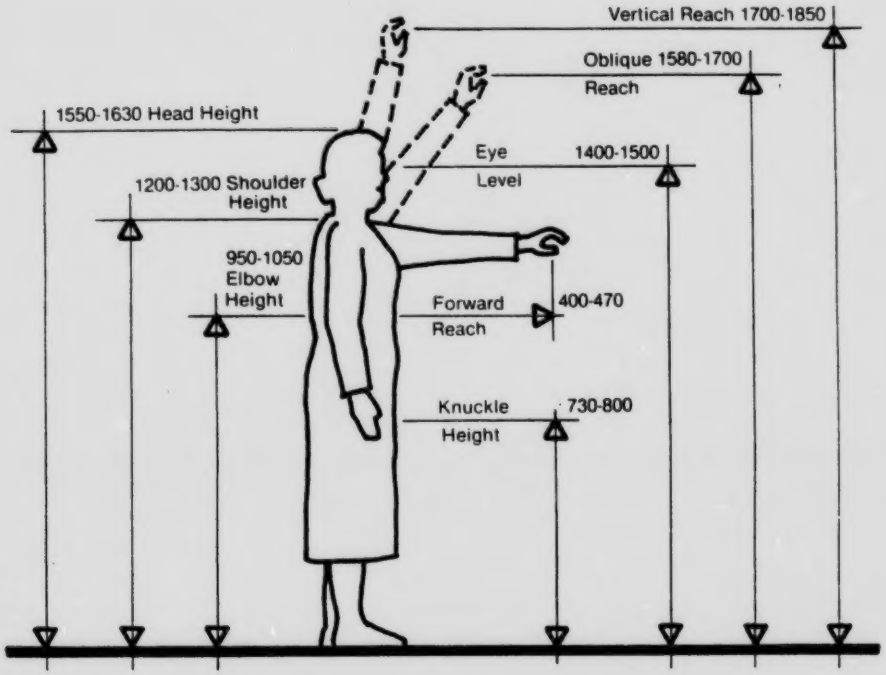
(2) reaching, grabbing, turning or holding objects such as handles, knobs, railings, or utensils which require adequate strength and coordination.

More than any other age group, seniors experience difficulties with hearing, vision, strength, and speed, as well as with fatigue or general weakness. Some who have difficulty walking may need canes, walkers, or mobilizers such as a wheeled walker; others may require wheelchairs. Seniors who have difficulty climbing stairs or who use a walking aid or wheelchair need wider corridors, doorways and stairwells. Some may even require lifts, elevators or ramps to move from one level to another. In fact, seniors who walk with difficulty or use wheelchairs cannot independently overcome level changes within or outside the house without the aid of ramps or an elevator.

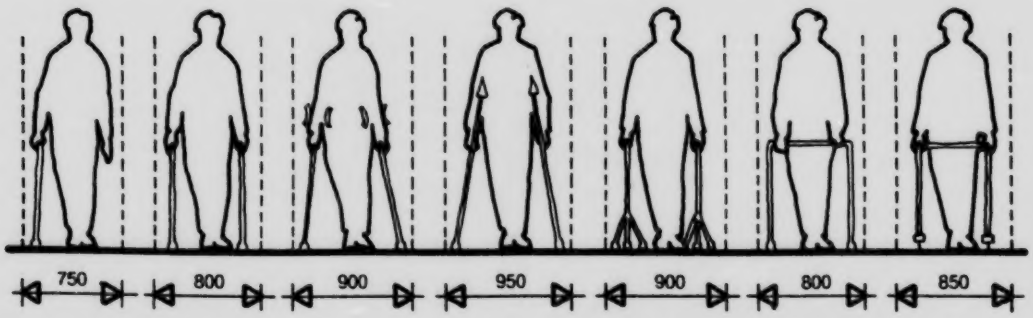
Without these improvements, some seniors will be forced to consider moving to more accommodating forms of housing. For many, this will mean seniors' apartments or lodges. Such choices not only contribute to an increasing demand for government-funded subsidized housing but also to the decline of seniors' health and general sense of well-being.

With these changes more seniors will be able to live a continued life of independence and good health within their own homes. This cost-effective solution benefits society and provides the dignified retirement seniors deserve.

The following illustrations indicate some reaching limitations of ambulant seniors and seniors in wheelchairs. All dimensions shown in this sub-section are in millimeters (mm).

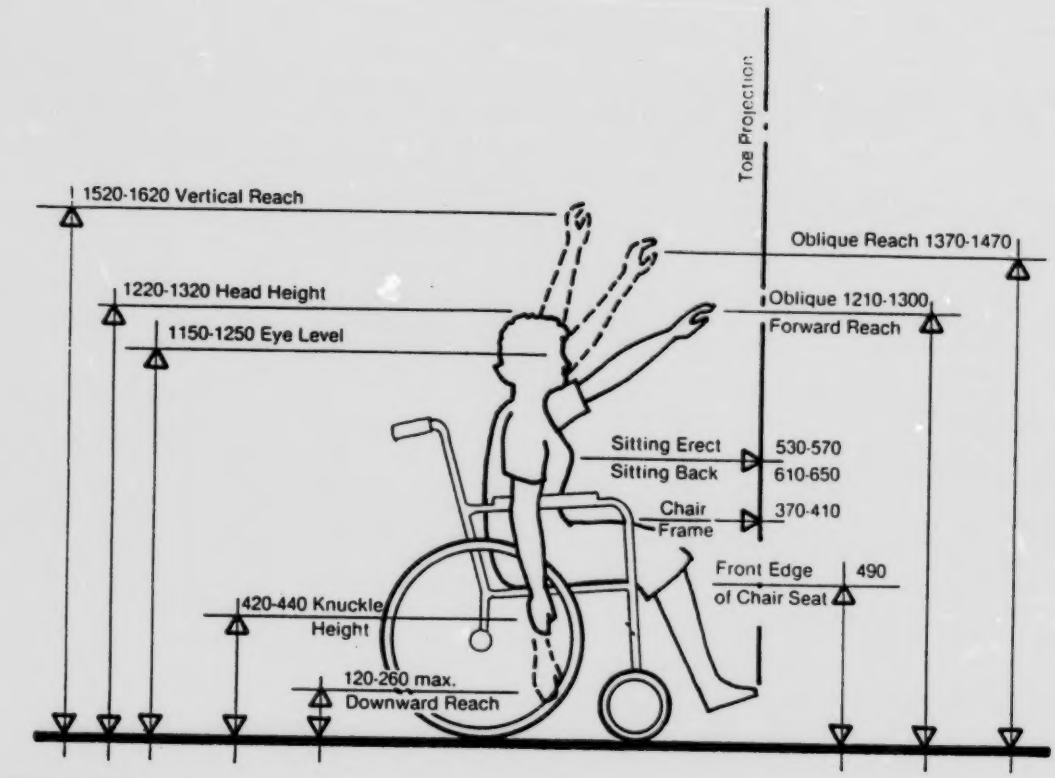


Ambulant Woman

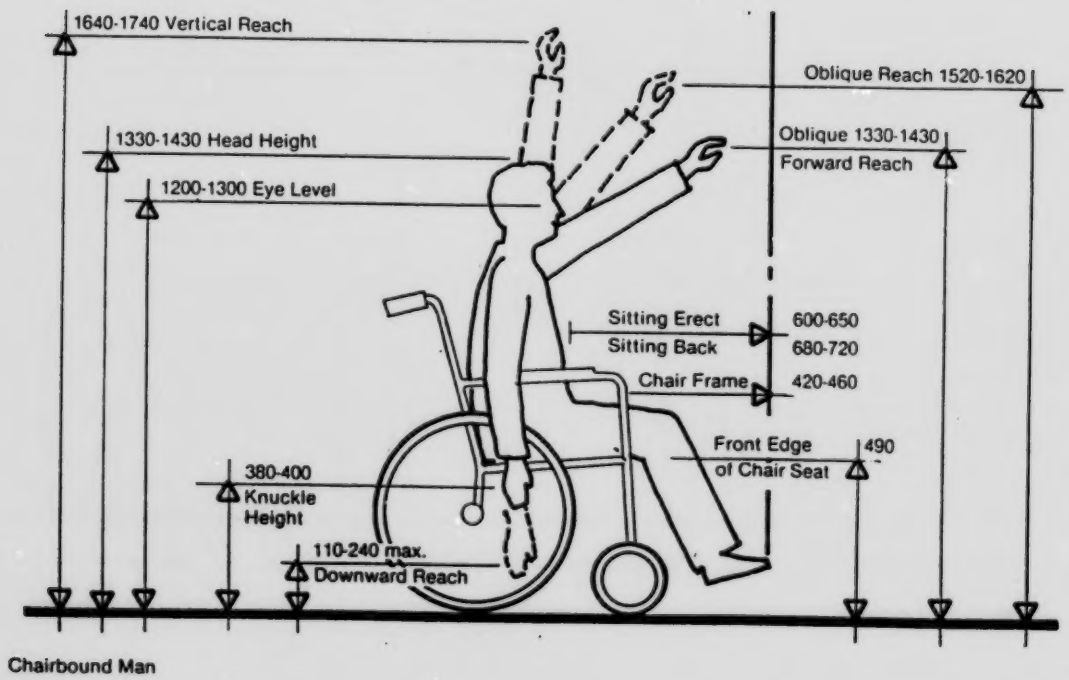


Space Used by Ambulant Disabled

Figure 1: REACH ARCS FOR AMBULANT SENIORS



Chairbound Woman



Chairbound Man

Figure 1A: REACH ARCS FOR WHEELCHAIR-DEPENDENT SENIORS

1.3 SCOPE

Although this report is intended to focus primarily on the residential needs of seniors with minor difficulties, it also considers the spatial and equipment needs of people who are unable to walk without the aid of crutches, braces, artificial limbs, walkers or wheelchairs. This report also examines the physical needs of older persons whose difficulties are such that they require regular assistance from another person. This need for assistance often means that seniors must relocate in institutional-care facilities.

The report considers design features which are essential in the operation of typical homes. This includes major features which are part of a residential property and minor devices, appliances and equipment which, although not fixed to the house, help seniors to cope more effectively in their home.

Major features involve renovations which alter the way in which space or equipment in the home work for people. Included in this category are entrance ramps, vestibules, elevators and mechanical lifts, bathrooms, and kitchens, as well as many appliances and fixtures within these rooms.

Minor changes involve relatively small alterations to dwellings. Although these changes do not affect the operation or circulation of a home, they bring important benefits for people with minor physical difficulties. They are also usually easy to install and inexpensive. For example, modifications to assist people with limited use of their wrists or hands may only involve minor changes to the home, such as new light switches, water taps, door knobs, drawer pulls or telephone dials.

1.4 REPORT ORGANIZATION

The remainder of the report is divided into five sections:

Chapter 2 discusses the exterior of the home. This includes (i) circulation limits and clearances for wheelchairs or walkers and (ii) vertical movement, including the space needed for ramps, elevators and stairs.

Chapter 3 discusses the interior of the home. This includes planning and design of (i) the entry and circulation areas, as well as enclosed vertical circulation; (ii) the kitchen; (iii) the bathroom; and (iv) controls communications and security systems.

Chapter 4 discusses the execution of work. This includes (i) zoning and building by-laws and procedures; (ii) design

of the work; and (iii) construction.

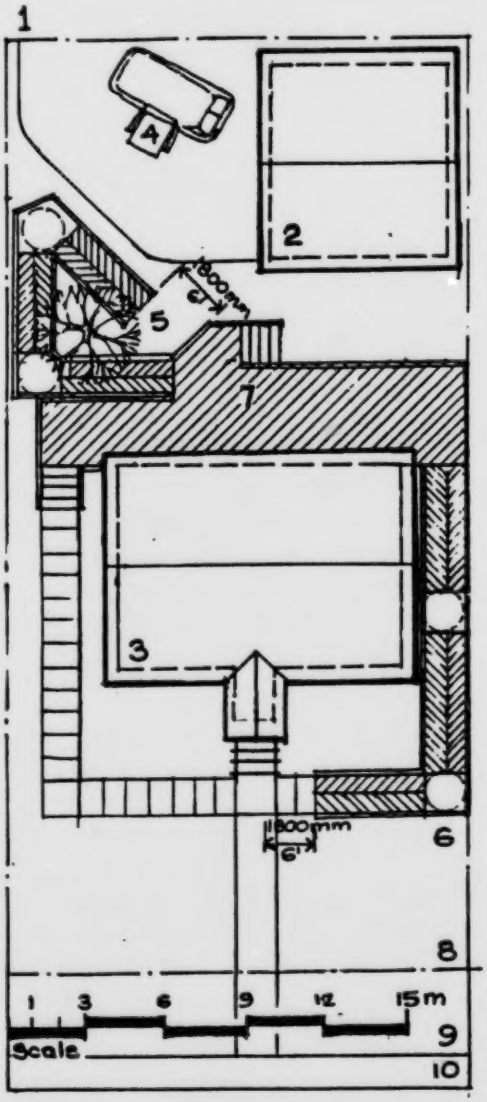
Chapter 5 outlines some support services which are available to assist seniors with technical and financial aspects of home renovation.

The final section presents conclusions.

CHAPTER 2

THE EXTERIOR OF THE HOUSE

This section deals with the horizontal and vertical requirements of outdoor circulation, taking into account requirements of seniors who can walk with difficulty, as well as those who use wheelchairs or aids.



Legend

1. Rear Lane
2. Garage
3. House
4. Wheelchair Van
5. Switchback ramp from driveway to deck
6. Alternative ramp from front walk to rear deck
7. Rear deck
8. Property line
9. Sidewalk line
10. Street line

Figure 2: EXTERIOR SPACE REQUIREMENTS FOR WHEELCHAIR-DEPENDENT SENIORS' HOMES

2.1 HORIZONTAL REQUIREMENTS

Seniors who depend on walking aids need the exterior of their homes to be as accessible as possible. The following suggestions are aimed at providing seniors with safe and comfortable access to their homes.

2.1.1 Ramp Lengths

The following are some of the horizontal space requirements for ramps in typical homes:

(1) A gentle ramp slope (gradient of 1:20) for a home with a main floor 1050 mm (3') above the outside grade level requires 21 m (60') of ramp. This can generally be accommodated along the side of the residence. (Figure 2)

(2) When designing a steeper ramp slope, (gradient of up to 1:12), allow less distance for the horizontal ramp length. Keep in mind that shorter ramp distances are more difficult to use for seniors who depend on manual or low-powered electric wheelchairs. Steeper outdoor ramps are also less safe in inclement weather, especially for seniors with walkers.

To increase ramp distance when limited space is available, use switch back ramps as illustrated in Figures 2 - 4.

(3) Provide a landing length that is, at least, equal to the ramp width for every 9000 mm (30') of ramp.

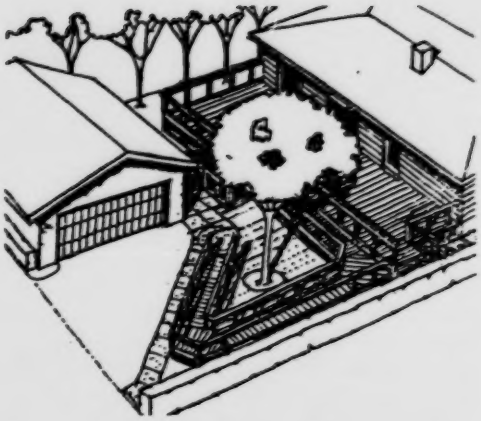
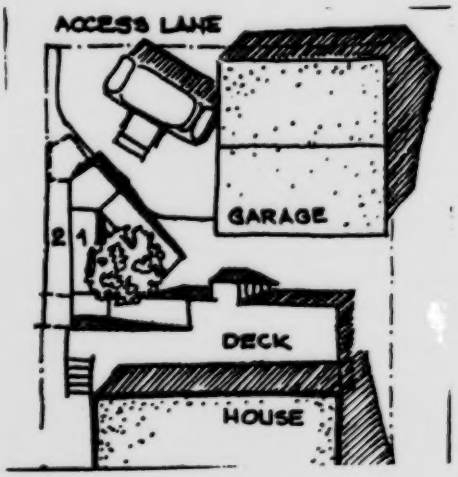


Figure 3: CONNECTING THE REAR DECK TO THE DRIVEWAY



Legend

1. Short steep ramp
2. Longer, more gentle ramp

Figure 4: INCREASING RAMP LENGTH

Ramp incline

2.1.2 Handrails (See previous page)

(1) Design the handrail so that its ends return smoothly to the wall, floor or a post.

(2) Extend handrails horizontally at least 300 mm (1') from the top and bottom ends of the ramp.

2.1.3 Widths of Walkways, Paths and Ramps

Another horizontal requirement to consider is the width of ramps, paths or walkways, and how adequate are their dimensions. It is particularly important there be adequate side clearance and an edge or protective curb to prevent seniors who use wheelchairs or walkers from slipping off the ramp. For maximum safety, the following design conditions should be observed:

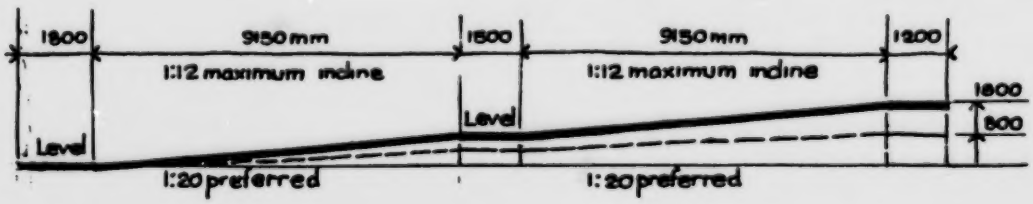
(1) When building a ramp, allow a clear width of at least 900 mm (3').

(2) When building a flat side walk or walkway, allow a width of at least 900 mm (3'). Where existing walks are too narrow, widen with an additional strip of concrete, asphalt paving, or interlocked paving brick on either side of the existing walk. Paving brick can also be used to provide an attractive edging to the walk.

(3) Allow a clear horizontal landing extending from the lower end of a ramp: a distance of at least 1800 mm. (6').

(4) Allow an intermediate landing (where possible) of at a least 1200 mm (4') and a landing at the upper end of a ramp of 1500 mm (5').

(5) If a multi-directional switchback ramp is introduced (e.g. a triangular ramp arrangement), allow for landings with turning circles of at least 1500 mm (5') at each bend (Figs. 3-4). This permits adequate turning room for either a wheelchair or walker.



Long ramp dimensions

2.1.4 Vehicle Clearances

Allow sufficient space around the vehicle to assure comfortable access. Figure 5 illustrates the acceptable clearances for common situations in accessing cars.

Allow adequate vehicle clearances between bay widths or around vehicles to provide access to the garage door, sidewalk or ramped driveway.

2.2 VERTICAL REQUIREMENTS

2.2.1 Stair, Ramp and Elevator Heights

Stairs, ramps and/or elevators are essential in overcoming the difference of approximately 900 mm (3') between the outside grade and the main floor of the house. New stairs are easiest to introduce, and ramps are only slightly more complicated. Elevators are the most costly and complex to introduce for outdoor access conditions.

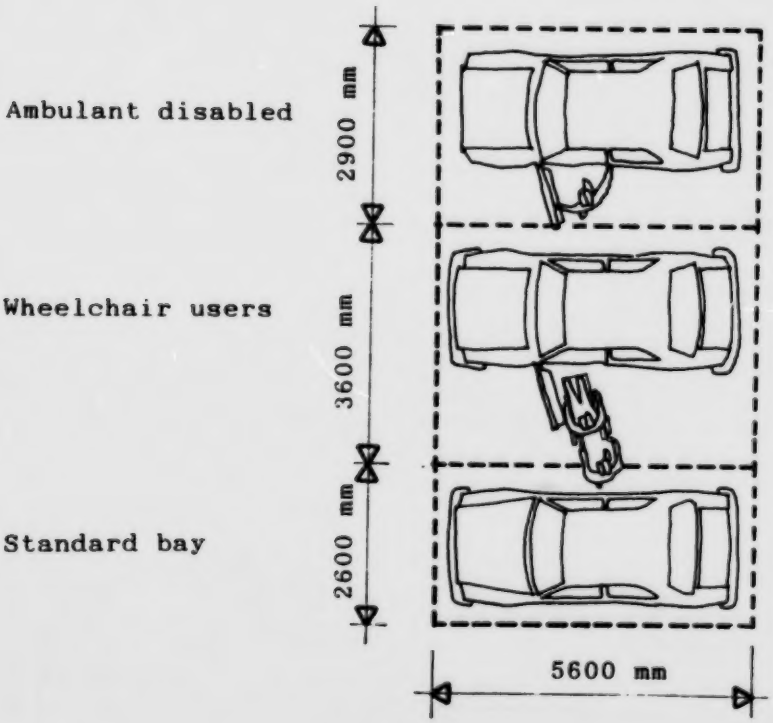


Figure 5: VEHICLE CLEARANCES-PARKING SPACES

The following are some design considerations for vertical circulation:

(1) For comfort and safety in new stair arrangements, allow riser tread ratios which are less than 1:2. This means that there will be a 175 mm (7") vertical rise for a tread depth of 265-280 mm (10"-11"). Thus, an 875 mm (2'-11") difference between the outside grade and the main floor of the home will require five risers of 175 mm (7") and four treads of 265 - 280 mm (10" - 11") for a total run of 1016-1118 mm (40"-44") plus a minimum top landing of 1200 mm (48").

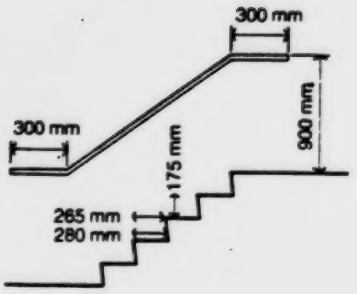
(2) Provide a stair handrail which is approximately 900 mm (36") high.

(3) When introducing a new ramp to the main floor, keep the ramp slope as gentle as possible with a height-to-length ratio which is closer to 1:20 than 1:12.

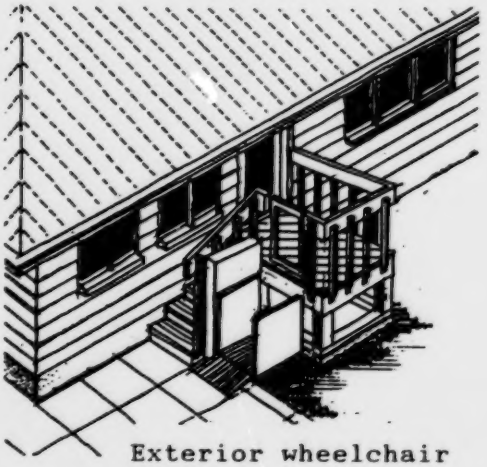
(4) Where the horizontal distances for ramps are limited, use an outdoor elevator to connect the levels. Dimensions for an outdoor elevator are illustrated adjacently. For further details, see also Sections 3.1.2 and 3.1.3.

2.2.2 Access from Garage

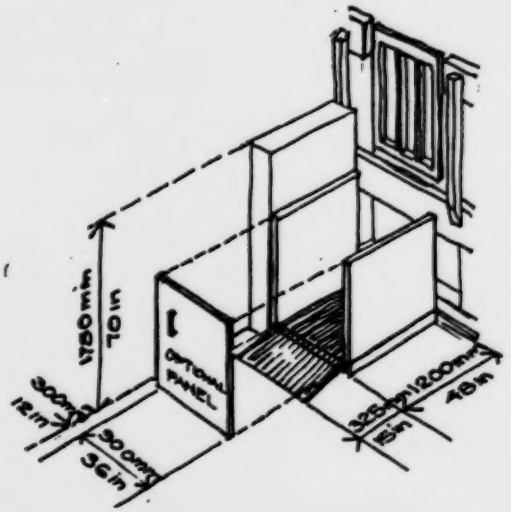
(1) Where there is sufficient vertical clearance and floor area within a garage or carport, construct an arrival platform where the vehicle is normally parked at the side door of the van. Make the platform



Recommended stair details



Exterior wheelchair elevator.



Dimensions for a wheelchair elevator.

approximately equal in height to the floor of the van, that is, 450 - 600 mm (1'- 6" to 2'). This reduces the ramp height which must be overcome from the van to the main floor of the home.

(2) If possible, construct a new door opening which is wide enough for a wheelchair, but which, because of the limitation imposed by the raised floor but fixed soffit height, will be less than standard height, that is, less than 6'- 8". Construct the new door opening in the side wall of the garage which leads to the access platform as shown. However, make sure that at least one standard door opening is provided elsewhere in the garage.

(3) Wheelchair vans generally require a clear height (garage door) of about 2325 mm (7'- 9").

(4) Connect a patio entry at the entrance level of the home to the wall of the garage with a ramped bridge as shown.

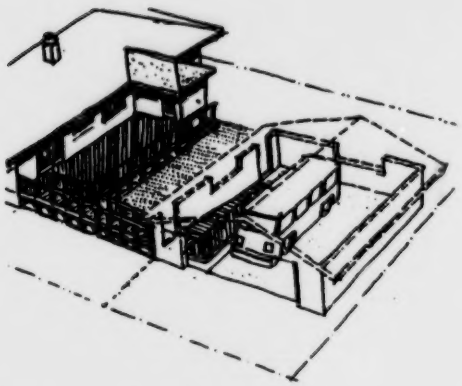


Figure 6: CONNECTING THE DECK TO AN ARRIVAL PLATFORM IN A GARAGE

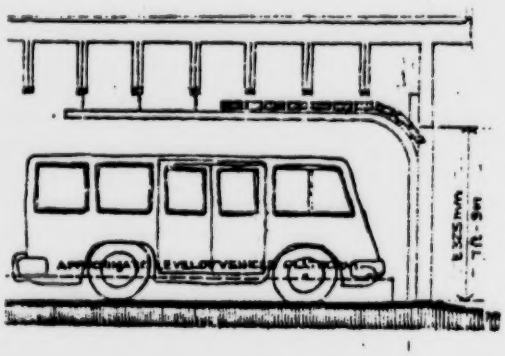


Figure 6A: SECTION THROUGH GARAGE SHOWING LINE OF ARRIVAL PLATFORM

CHAPTER 3

THE INTERIOR OF THE HOME

In making interior spaces more efficient and inviting for seniors, there are a number of important considerations. These include accessibility, safety, convenience, ease of maintenance and personal control.

Accessibility not only means access to all rooms and spaces but also the ability to use the facilities and equipment within those spaces effectively.

Safety means the ability to function safely within the entire home and the ability to safely use all or most of the appliances and equipment within.

Convenience means not having to exert oneself unnecessarily.

Ease of maintenance refers to the physical arrangements and equipment within the home which are designed to help seniors cope effectively and with little effort with a variety of cleaning maintenance and related tasks.

Personal control is essential for a sense of independence. Such control includes command of all basic systems in the home and the ability to call for assistance when necessary.

This chapter considers the design of essential interior spaces in seniors' homes which, unlike outdoor areas, can be made secure and comfortable for seniors at all times. The chapter is organized into four sections: entry and circulation; design considerations for barrier-free kitchens; design aspects of barrier-free bathrooms; and, lastly, security controls and electronic communications. (See Figure 8, page 17).

3.1 ENTRY AND CIRCULATION

The entry to a home can have several important purposes:

(1) a passage from outdoors to indoors, and a primary means of escape in an emergency;

(2) a space which leads into all other rooms or spaces in the home;

(3) a weatherlock to protect the interior of the home against sudden entry of unwanted cold air or moisture; and,

(4) a secure barrier to intruders.

Three aspects of entrance ways are considered in this subsection:

(1) the organization of horizontal and vertical spaces and clearances;

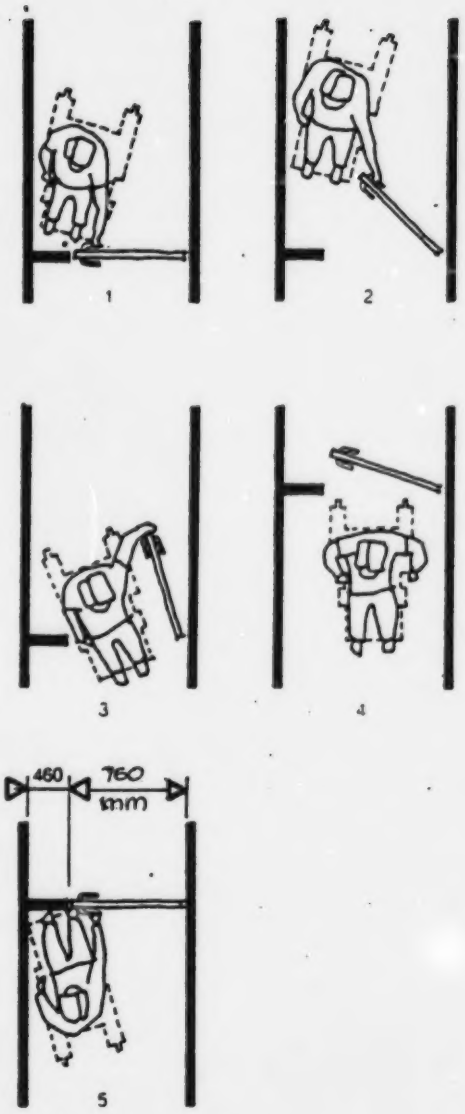
(2) construction details for modifications to the entry; and,

(3) major devices and appliances which can be used to overcome vertical distance.

3.1.1 Spatial Organization

Barrier-free design of horizontal and vertical circulation within a home is essential to enable physically impaired senior residents to function independently. Although most ambulant seniors can cope effectively with the normal clearances in a typical home, seniors who use a wheelchair or walker may find some important spaces too narrow to pass through.

A common area of difficulty is the entry or vestibule area. Often it is less than 900 mm (3') wide and less than 1200 mm (4') deep. As the illustrations show, these dimensions are inadequate for barrier-free wheelchair access. Such access requires the vestibule or entry space measure at least 1220 mm wide x 1500 mm deep (4'- 1" x 5') clear of door swings.



Typical door approach used by wheelchair operators

The Vestibule

Given Alberta's climate, a weatherlock or transitional space at one or more entrances to a home is strongly recommended. This is particularly important for homes in which physically impaired seniors move slowly and need more time to enter or exit. This transitional space can be achieved in several ways:

A vestibule can either be built into or added onto an existing home as a new structure. It can be located at the front or rear entrance or both. The new vestible should be large enough to include a bench or chair for a senior to use while putting on or taking off street clothes and footwear.

(1) When added at the rear of a home, the vestibule may be combined with a laundry-utility area, as shown in Figure 7. If the entry is designed for a senior who requires a wheelchair or walker, it should include:

(i) inner and outer doors, with sufficient clearance between doors, walls, and other installations;

(ii) a durable waterproof floor with a drain and hand-held-telephone-type shower for washing off the wheel chair. A lightweight portable dryer is also recommended for drying a wet wheelchair;

(iii) an area that is large enough to transfer comfortably from one chair to another. As some seniors use different wheelchairs indoor than out, make sure there is room to store the extra chair when it is not in use; and

(2) vestibule or similar weatherlock space as part of the added-on larger space. For example, a greenhouse or an attached garage can include an all-weather

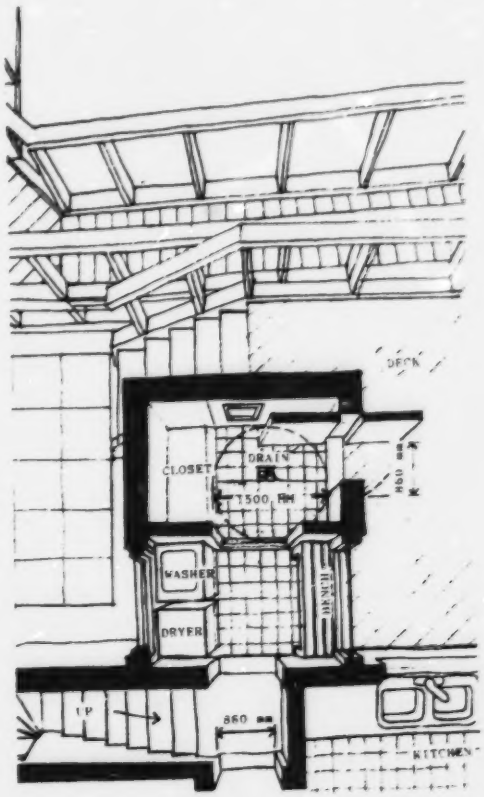
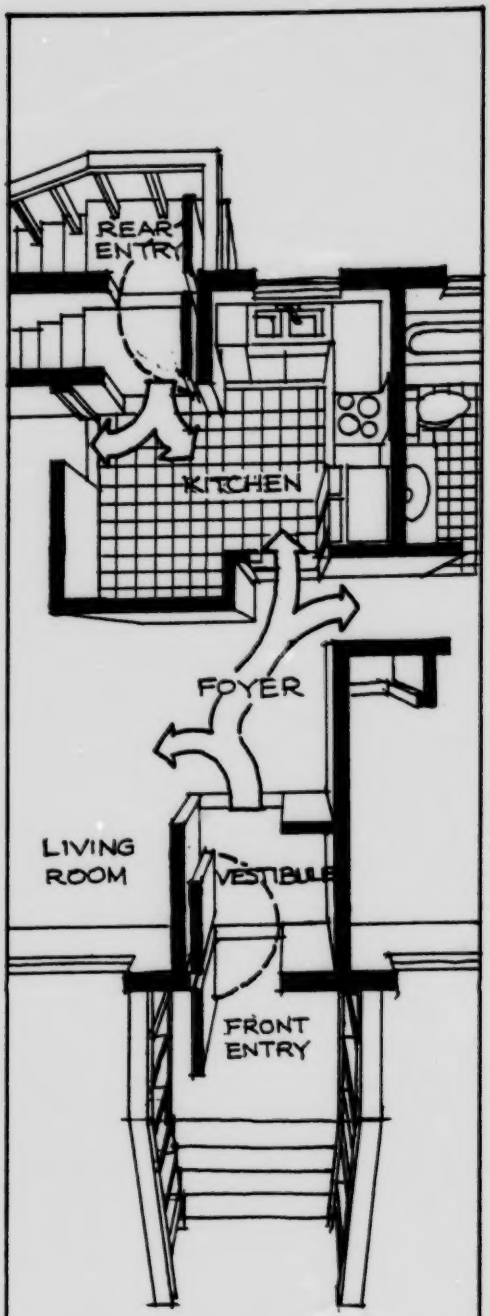


Figure 7: ADDING A NEW VESTIBULE WITH A LAUNDRY-UTILITY AREA TO REAR OF HOME

entrance or vestibule. However, the internal dimensions of such a space (width, length and height) must be sufficient to accommodate a barrier-free entrance as shown.

The Foyer

The front entry to a home often comprises two spaces: (1) a vestibule or weather-lock and (2) a foyer or interior entrance hall. Usually located just inside the vestibule, the foyer is often the place in the home where most other major circulation spaces converge. These include the living room, the kitchen, the corridor to the bedroom area, and the stairs to the basement, or second storey, in the case of a two-storey home. Often, the foyer is only an enlargement of an interior hallway or corridor. It should include a bench or chair, a mirror and/or a closet or clothes rack for outerwear for an ambulant senior unless these items are provided in the vestibule. If space is available, provide a washroom or powder room connected to the foyer or locate it nearby. If no other barrier-free bathroom is available on the same level, and if the washroom is large enough, it should be redesigned for barrier-free access. In a barrier-free dwelling ensure that foyer dimensions are adequate for a wheelchair to turn (e.g. 1500 mm (5') circle). Provide a smooth floor finish, such as hardwood or linoleum.



Interior circulation around main entrances to typical home

Hallways, Corridors, and Doorways

As hallways, corridors and doorways are major circulation areas, they must be kept barrier-free for wheelchair- bound seniors. The following design elements should be considered:

(1) Make exterior entry doors a minimum width of 860 mm (2' - 10").

(2) In a corridor or passage in which a wheelchair approaches a swinging door (for example, a kitchen) allow an additional 590 mm (1' - 11") to permit the wheelchair to move clear of the opening door. This requires 1260 mm (4' - 2") clear width of corridor where there are swinging doors.

(3) At the end of a main circulation corridor or interior hall, allow sufficient space for wheelchairs to turn 360 degrees (1500 mm (5') circle) or 90 degrees into one or more rooms (that is, a 1200 mm (4') circle).

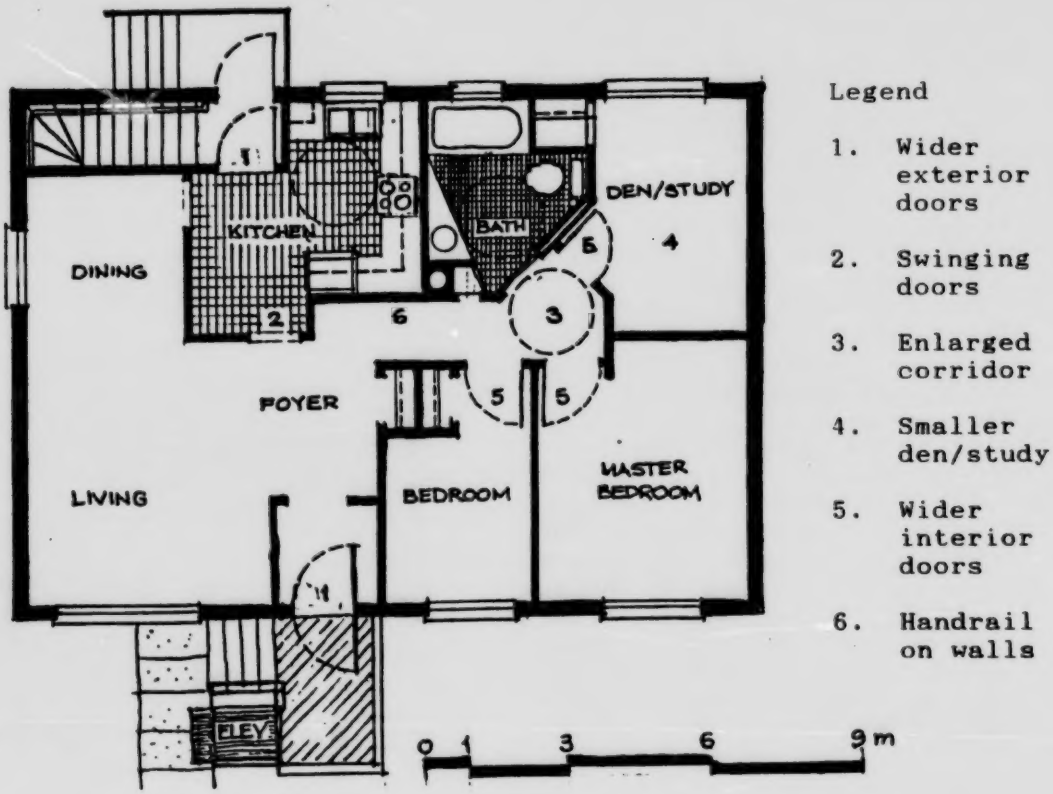


Figure 8: TYPICAL HOUSE PLAN RENOVATED FOR WHEELCHAIR ACCESS

(4) Where an existing corridor is too narrow, enlarge it by reducing the size of existing rooms or storage areas, as shown in Figure 9.

(5) Ensure that, when open, interior doorways have a clear width of approximately 760 mm (2' - 6").

(6) Install a handrail 850 mm (2' - 10") above the floor along at least one side of the corridor for ambulant seniors with walking difficulties.

Interior Stairs

In many Alberta bungalows, stairs to the basement were often built steeply to ensure a maximum amount of usable floor space. The stairs were sometimes steeper and narrower than they might have been, and winders were used to maintain maximum headroom in tight turns. Although such interior stairs are still functional for a younger family, they are neither safe nor comfortable for many seniors.

Stairs are relatively costly and complicated to change. Interior stairs can be modified or replaced, outside the existing house thereby increasing the dimensions of some other major space, such as the dining room. (see Figures 10 and 11.

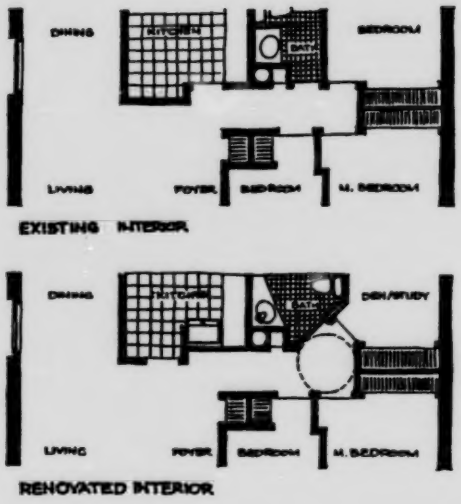


Figure 9: IMPROVING INTERIOR ACCESS

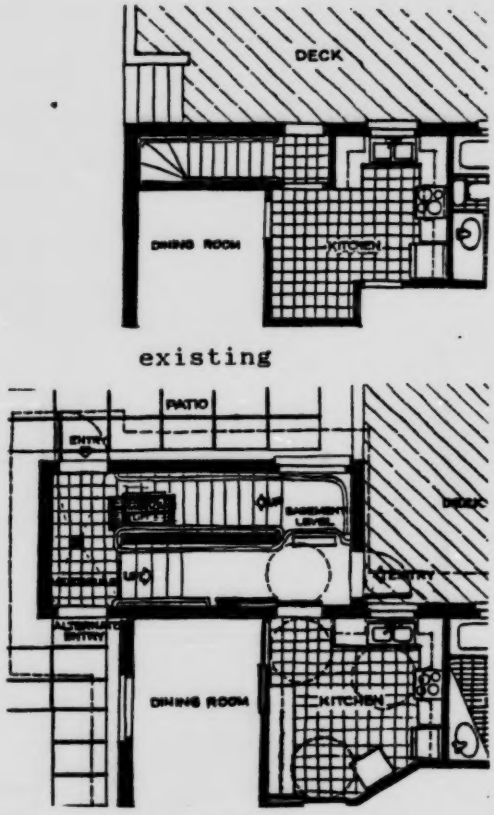


Figure 10: RELOCATION OF STAIRS AT KITCHEN ENTRANCE

Ambulant seniors who are able to use existing interior stairs but with difficulty may be aided by the following simple renovations:

(1) skid-resistant nosings and treads;

(2) more secure and comfortable handrails; and

(3) improved lighting.

Though more costly, stair modifications eliminate steep, narrow stairways with winders. Not only may the stairs be rebuilt with more comfortable slopes, they can also be relocated, such as within a new rear entrance.

3.1.2 Construction Examples/Suggestions

A number of construction suggestions for renovations to horizontal and vertical circulation are shown in the following section.

Figure 11 illustrates the replacement of an existing stair with a new one (including a chair lift). The construction shown is at the rear entrance of an existing home.

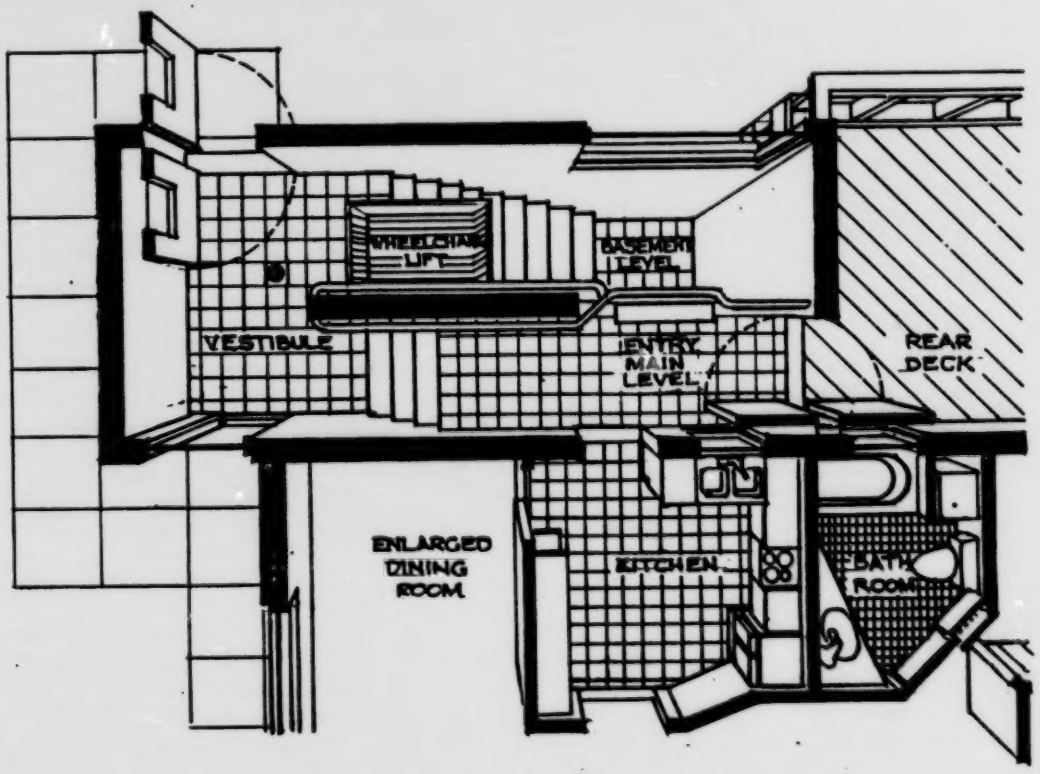
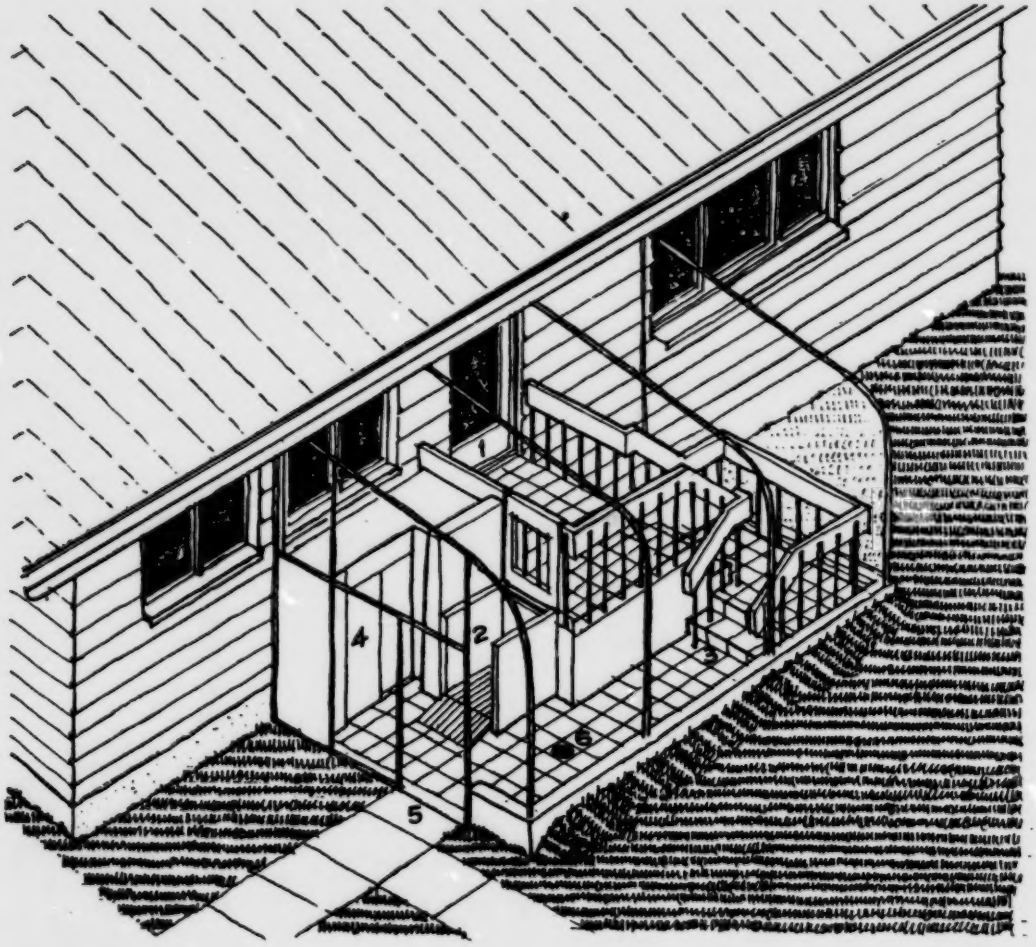


FIGURE 11: WHEELCHAIR LIFT IN AN ENLARGED STAIRWELL AT REAR ENTRANCE SERVING THREE LEVELS

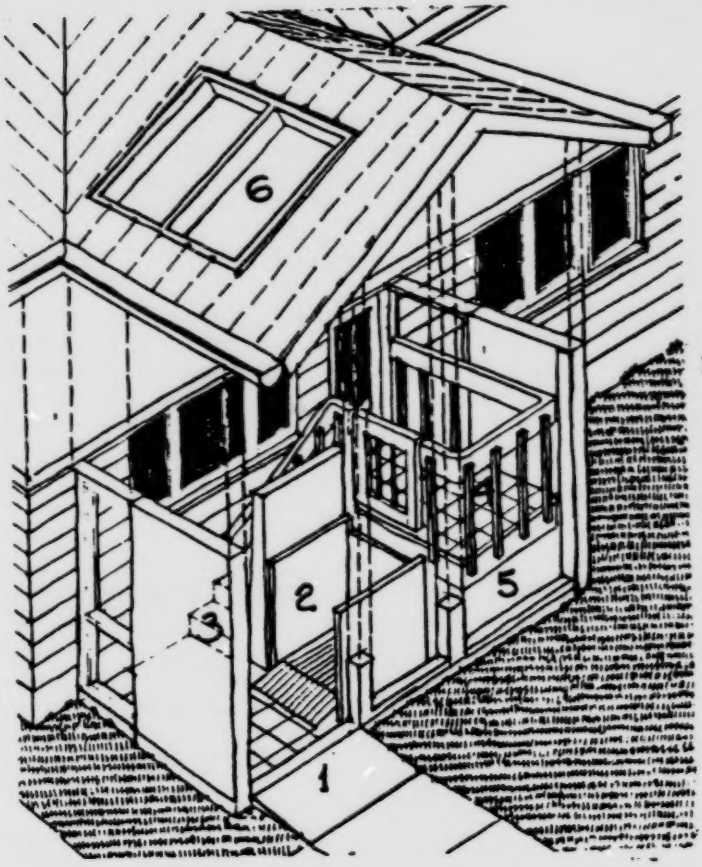
Figures 12 and 13 illustrate two ways to add a new entrance enclosure at the front of a home. The first involves constructing a new entrance stair and elevator arangement within a greenhouse-type enclosure; the other, constructing the same vertical-circulation aids within a more enclosed entrance structure.



Legend

1. Entry to foyer
2. Elevator serving two levels
3. Entrance stairs
4. Clothes closet
5. Entry to vestibule
6. Floor drain

Figure 12: NEW ENTRANCE STAIR AND ELEVATOR IN GREENHOUSE ENCLOSURE



Legend

1. Entry to vestibule
2. Elevator serving three levels
3. Entrance stairs
4. Entry to foyer
5. Elevator entry at basement
6. Skylight optional
7. Floor drain

Figure 13: ENCLOSED WHEELCHAIR ELEVATOR FOR BARRIER-FREE MAIN ENTRANCE WITH ROOF REMOVED

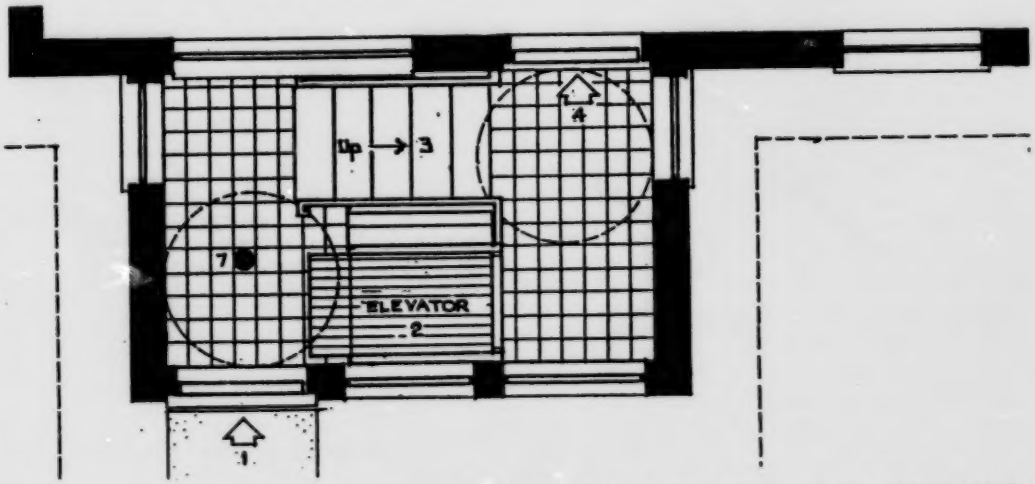


Figure 14 : PLAN OF WHEELCHAIR ELEVATOR FOR MAIN ENTRANCE TO A TYPICAL HOME

3.1.3 Major Devices For Vertical Circulation

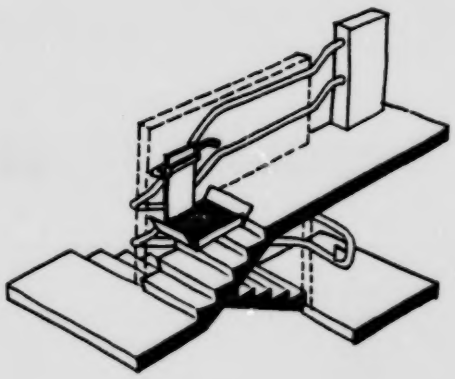
Wheelchair-Stair Lift

There are a number of wheelchair lifts available for both straight-run stairs or those requiring a 180 degree turn, as noted in the illustration below. One such manufacturer is Garaventa, however, these passenger chair lifts are more expensive, as the Garaventa GSL-1 costs about $20,000 to install in a two-storey home with basement. This type of lift also requires a stairwell width of about 1016 mm (3' - 5" +/-) to allow 275 - 300 mm (11" - 12") between the lift platform and the opposite stair wall.

The cost of a single passenger chair lift can range upwards of $4,700. Wheelchair-accessible lifts range from $10,000-$20,000 for lift equipment and installation alone.

Elevators

Some wheelchair-bound seniors cannot transfer themselves easily to and from a wheelchair or a passenger lift at the top and bottom of a flight of stairs. Therefore stairwells that are too narrow to accommodate either a wheelchair lift or a passenger lift can pose a difficulty. Consider a wheelchair-accessible elevator as a further access option. This aid can provide barrier-free access to all levels of a home, bungalow or multistoried home. When



Garavanta wheelchair lift

Passenger stair lift

long ramp distances are not acceptable or cannot be accommodated, an elevator can also provide access to at least the main floor of a home from the outside grade.

Enclosed elevators are expensive. Even a minimal structure required to enclose an entry, lift, and adjoining stairs can cost $15,000. Add the cost of a modest two-stop elevator at $10,000 and, depending upon the design details, the cost of such an addition could range from $25,000 to $40,000.

3.1.4 The Single Level Option

In light of the significant cost of an enclosed elevator or stair lift, and the potential loss of interior floor space, many seniors may choose to limit barrier-free access to a single level of their home and put in ramps. This would limit the required construction to the cost of a wood or steel ramp. These range from $1500 - $2000, plus an additional $1000 - $1500 to enlarge the door opening and refit a new larger entrance door. Therefore the total cost would range from $2500 - $3500.

There are also other hidden costs for barrier-free access to the main floor. Assuming that sufficient space is available to relocate such equipment, laundry appliances, water and gas meters, furnace and water heater controls, and any monitoring equipment must be either relocated or duplicated on the main floor.

If there is a freezer in the basement, it too must be relocated to the main floor, if it is to be wheelchair accessible.

The following are some estimated costs for relocating residential systems and controls from the basement to the main floor of a home:

(1) $2000 - $2500 to relocate necessary circuit breakers and gas and water shut-off valves to the main floor.

(2) $1000 - $1200 to relocate laundry equipment from the basement to the main floor. This includes the installation of a new floor drain, water valves, and a new waterproof floor finish.

Range of estimated cost (1) + (2): $3000 - $3700.

3.2 THE KITCHEN

Adequate space and facilities to prepare meals are essential for seniors to live independently. In this respect, the kitchen is one of the most important rooms in the house. However, in many homes, kitchens need modifications to the space arrangements and equipment to enable seniors with physical difficulties to operate independently with comfort and security.

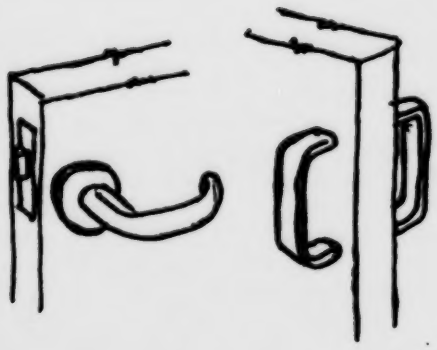
The physical difficulties seniors experience are:

(i) reduced ability to bend, stretch or reach;

(ii) reduced ability to hold onto or carry objects with either one or both hands, which poses difficulties with some appliances and utensils; and

(iii) reduced energy level, which limits seniors' ability to undertake physical activity.

Large letters on cannisters



Lever and D-type door handles

In many older homes, energy-saving aids may not fit into an existing kitchen without significant renovation. Seniors who require wheelchairs, walkers, or other mobility aids when they work in the kitchen need wheelchair-accessible facilities within the limited space of a conventional kitchen, seniors may be unable to move about or turn easily with their wheelchairs or walkers.

The kitchen of an ambulant senior who is able to work standing up requires modest inexpensive changes. These changes might be as simple as labelling containers with larger lettering for those with poor vision; changing appliance-control knobs on equipment and appliances for those with poor dexterity and physical strength. For seniors who suffer from arthritis in their hands or limbs, easy-to-manage taps, door handles and drawer pulls are inexpensive and work well. Improved lighting over counters and table tops is of benefit to everyone.

Changes in kitchen design to accommodate unwieldy wheelchairs and walkers may be more extensive. These changes may involve enlarging doorways, modifying door arrangements, increasing clearances between counters, lowering counter heights and adding worktable surfaces.

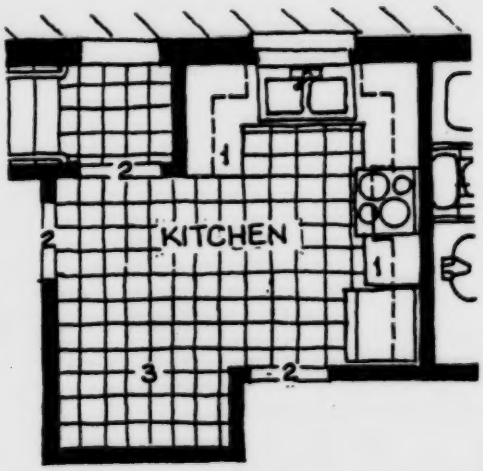
This following subsection examines the changes which may be required to kitchens to compensate for seniors' physical impairments. It considers the organization of space and clearances, changes which are required in construction for major and minor appliances as well as special kitchen aids to assist with food preparation, cooking and washing up.

3.2.1 Organization of Space and Clearances

Horizontal Dimensions

Figures 15, 16 and 16A illustrate three basic kitchen floor plans.

Figure 15 illustrates conditions for an existing kitchen in a typical Alberta bungalow indicating door openings, counter areas and location of appliances. This typical kitchen with adjacent eating/and food preparation areas has conventional counter arrangements and narrow door openings and tight clearances between counters.

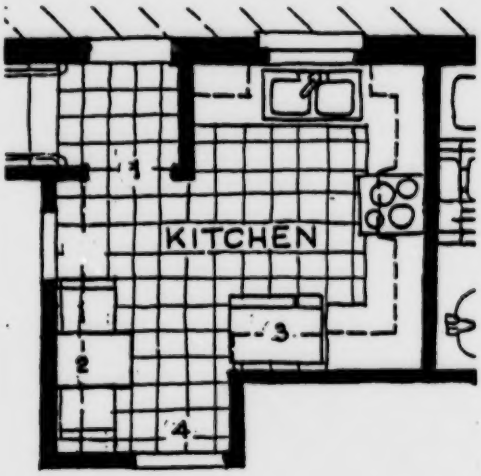


Legend

1. Limited Counterspace
2. Narrow Doorways (2'-6" (750 mm))
3. Breakfast Nook

Figure 15: KITCHEN IN A TYPICAL EXISTING HOME

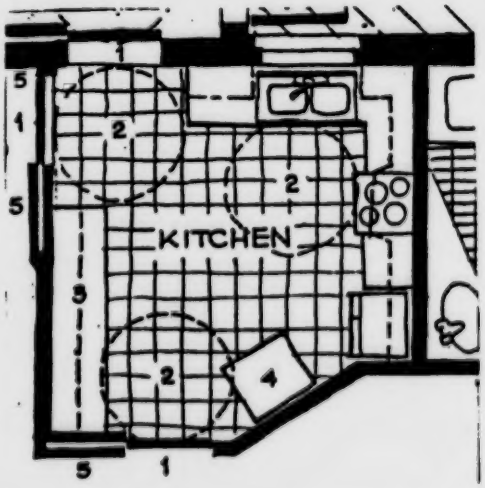
In Figures 16 and 16A renovations have resulted in wider door openings, rearrangement of appliances, improved outdoor access, an enlarged dining area and barrier free circulation for a wheelchair. Sliding doors have been introduced wherever possible; counterspace and storage areas have been extended and made more accessible; counter heights have been lowered (by 50 - 75 mm (2"-3")) and the space beneath the sink has been redesigned to permit a chairbound senior to wheel in and work in a seated position.



Legend

1. Doorsill removed
2. Extended shelf space over table
3. Refrigerator-freezer side-by-side
4. New door location off foyer

Figure 16: KITCHEN MODIFIED FOR AMBULANT SENIOR



Legend

1. Wider door openings
2. 5' (1500 mm) circle for wheelchair clearance
3. New cabinets and counterspace
4. Rolling cart with worktop
5. Sliding doors

Figure 16A: KITCHEN MODIFIED FOR WHEELCHAIR ACCESS

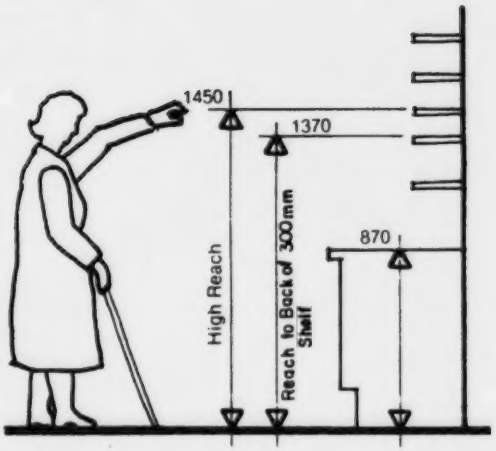
Cabinetry and Reaching Limits

Seniors in wheelchairs have a shorter reach, 1200 - 1370 mm (4'0" - 4'7"). However, they have an effectively lower reach from a chair or wheelchair than ambulant seniors and can reach as low as 250 mm (10").

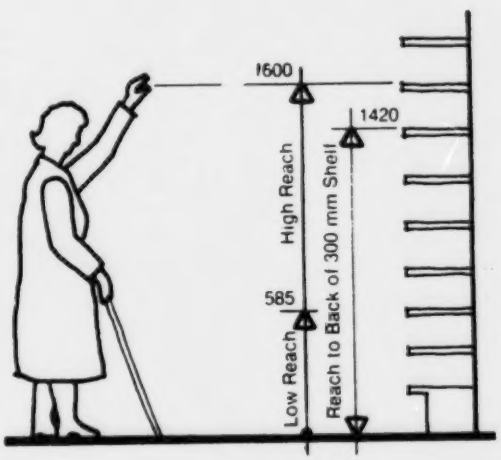
In conventional kitchens standard countertop heights are 900 mm (3'); some countertops are slightly lower at 870 mm. In extreme cases counters can be lowered as much as 200 mm to accommodate the special needs of seniors in wheelchairs. Low counter heights may present problems in the vertical dimension with certain kitchen appliances, such as dishwashers.

Although counters can be as low as 750 - 800 mm (2'-6" - 2"-8") without severely affecting the functioning of ambulant adults, any decision to make drastic changes to countertop heights in an existing kitchen should be considered with caution. Such changes may not be cost effective over the long term.

The following suggestions are useful guidelines for improving kitchen/area accessibility for both ambulant and seated seniors.



Ambulant senior reaching limits with kitchen counter and shallow shelves



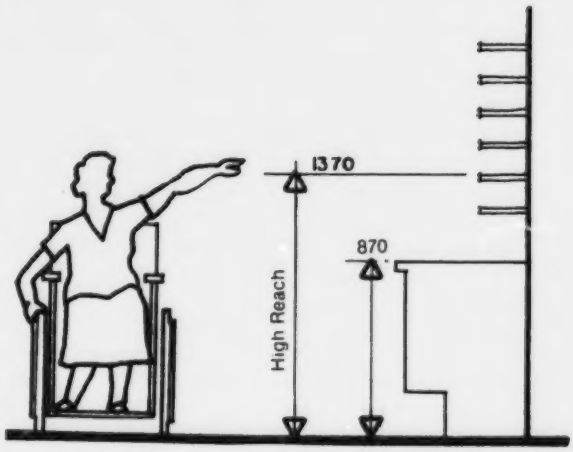
Ambulant senior reaching limits with deep shelves

(1) Install usable shelves above countertop areas at less than 1370 mm (4'-7") above the floor for a person with normal reach.

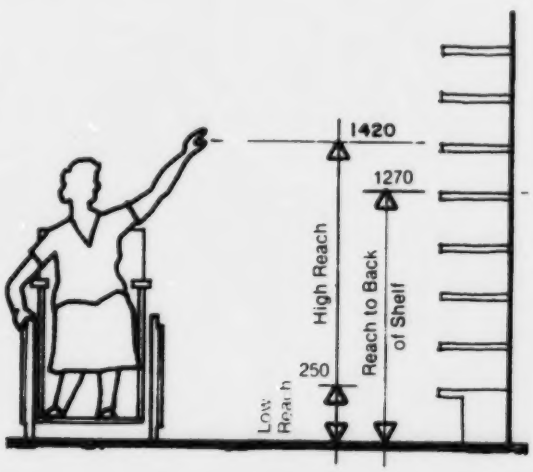
(2) Make pantry cupboards approximately 225 mm deep with a maximum depth of 300 mm (9"-12").

(3) Improve access to deep shelves under countertops by using roll-out guides for shelves, pans or baskets. Ensure that the guides are fitted with lock-in devices to prevent them from being pulled out of their tracks.

(4) Install fixed deep shelves below 1420 mm (4'8") and above the 585 mm (1'3") level.



Wheelchair reaching limits with counter and shallow shelves



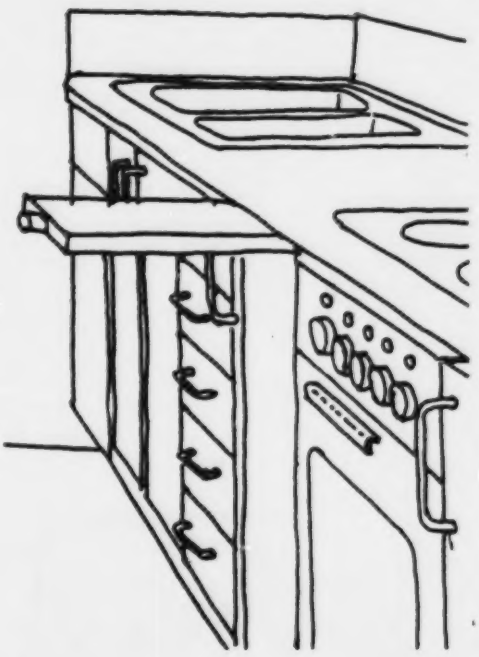
Wheelchair reaching limits - deep shelves

There are several ways to create kitchen areas that are a convenient height for wheelchair-bound seniors when countertops cannot be lowered significantly below 900 mm (3').

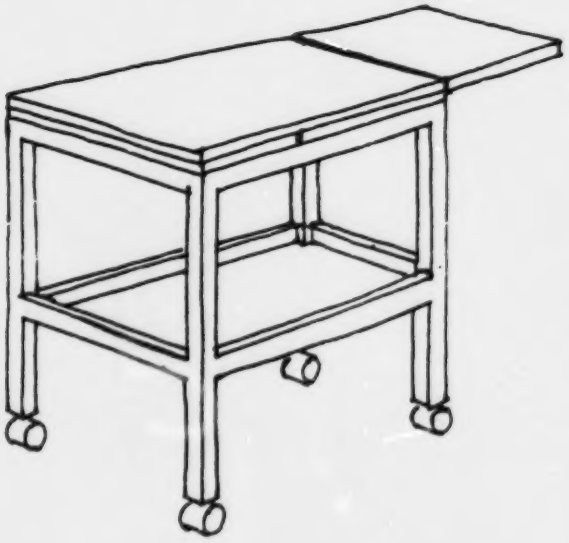
(1) Install one or more roll or slide-out cutting boards on shelves inserted at least 25-50 mm below a normal countertop height (IKEA, System 210 no. 13, $24. - $30, depending on the size.)

(2) Install a low work table.

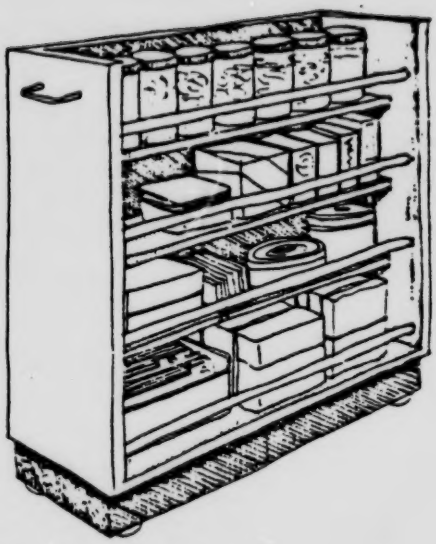
(3) As a supplement or alternative to the kitchen table work surface, use a mobile food/preparation trolley which will fit under a kitchen counter, such as Poggenpohl's undercounter serving trolley; and IKEA's Halsa and Espri serving tables.



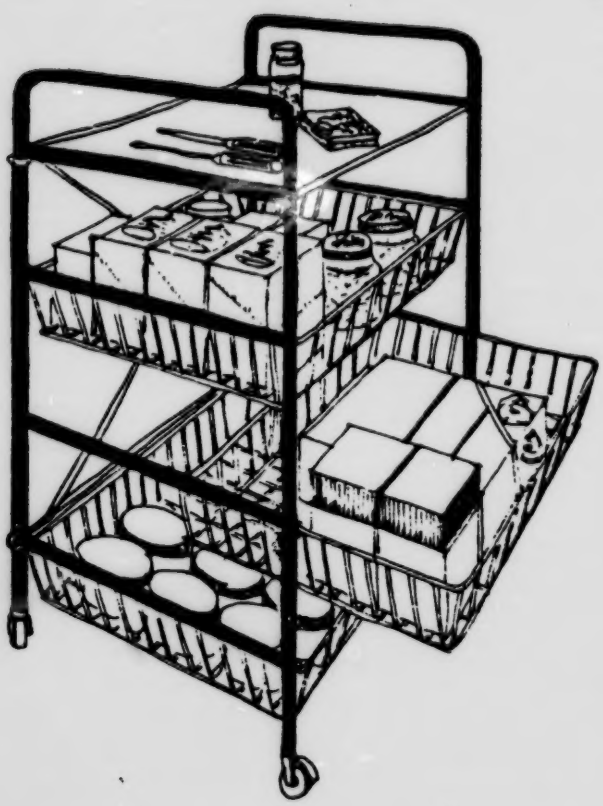
Slide-out cutting board

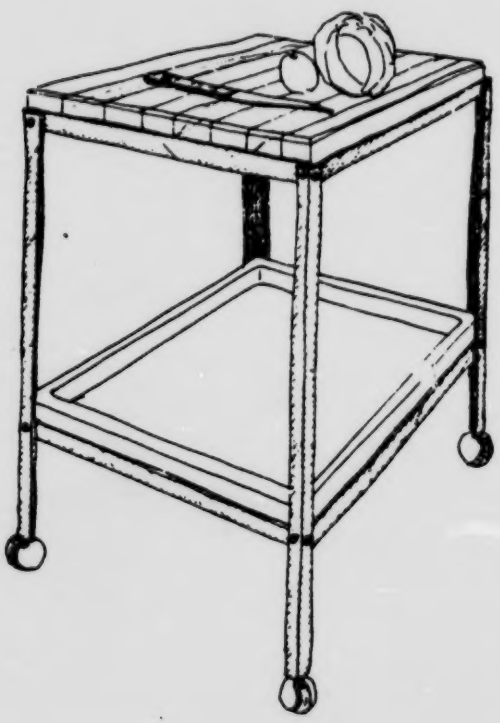


Make sure that the trolleys are light enough for a senior to push or pull easily. Alternatively, use a light-weight basket cart to move supplies, untensils and appliances to and from kitchen storage areas to either the kitchen work table or the dining room table. These carts are available from most department stores or hardware-kitchen supply outlets.



Custom designed roll-out undercounter storage unit





Lightweight kitchen carts and trolleys

3.2.2 Construction Details

In the renovation of a typical bungalow kitchen, Figure 15, Page 25, a number of construction changes are shown in the kitchen area. These include relocation and reconstruction of door openings to the kitchen, removal and replacement of existing stairs to the basement and redesign and reogranization of kitchen cabinets. Details of these changes are shown in Figures 16 and 16A, Page 26. They also illustrate changes in floor areas and clearances which are possible for both the kitchen and dining room.

The Kitchen Door

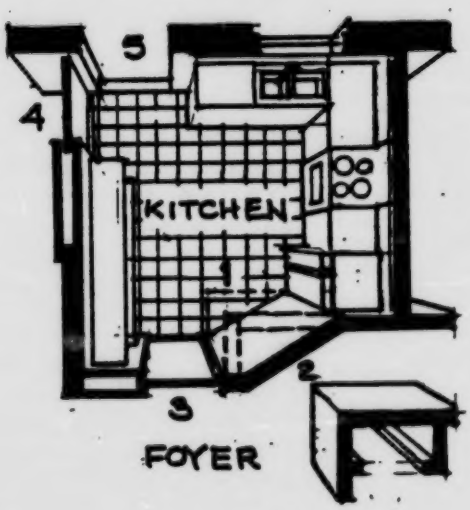
To enlarge the kitchen and make it barrier-free for a wheelchair or walker, the following changes to door openings and circulation arrangements are recommended:

(1) Move the door between the kitchen and the foyer toward the old breakfast nook (300 - 600 mm (1'-2')).

(2) Realign the wall of the hall corridor and the kitchen to enlarge the kitchen toward the foyer.

(3) Install a sliding door to close the new wider (760 mm) door opening. Install the sliding doors on the foyer and dining room sides. This leaves space free within the kitchen.

(4) Remove the old basement stairs and rebuild a new floor over the old stairwell opening. This will expand the usable area in both the dining room the the kitchen. Once the new floor has been built, install a new door opening between the dining room and the kitchen; double-swinging doors with slow closing hinges are best. They are easily accessible to wheelchairs



Legend

1. Relocated kitchen door
2. Realigned corridor
3. Sliding door between kitchen and foyer
4. Relocated stairs
5. Enlarged exterior doorway

Kitchen door relocation

and walkers and permit the person using them time to pass clear. Swinging doors should include eye-level panels in the door of either wired glass or plexiglass. Provide metal kickplates at the base of the doors to minimize scuffing by a wheelchair or walker.

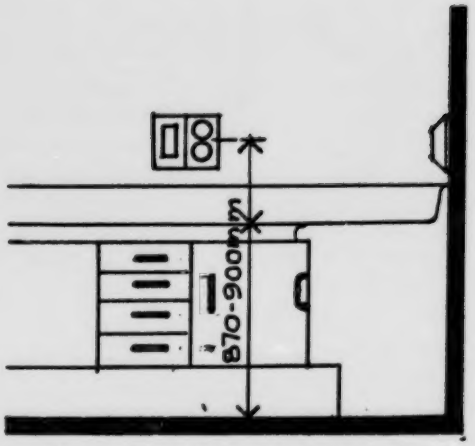
(5) Install a wider door from the new rear stair lift (Figures 10 and 11, Pages 18 and 19) or elevator to the kitchen to ensure barrier-free access. This should also have a clear opening of at least 860 mm. Install at least a single out-swinging or sliding door with a weather tight seal.

Electrical Outlets (Kitchen)

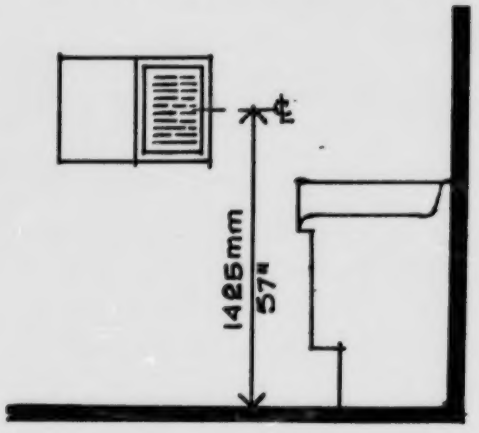
(1) Where the kitchen is being rewired, provide at least three double wall plugs for small appliances within the kitchen area. These outlets should be accessible from the counter top.

(2) Install a breaker box in or near the kitchen area and the rear entrance door. Install the centreline of the box at a height no greater than 1425 mm (57").

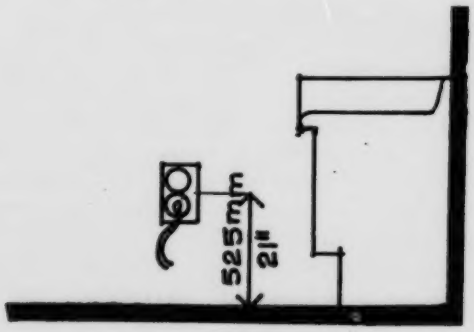
(3) Place low wall outlets on blank walls at least 525 mm (21") above the floor. This outlet height reduces the need to bend either from a standing position or from a wheelchair.



(1) Typical height of countertop rocker switch and wall plug. (High amperage)

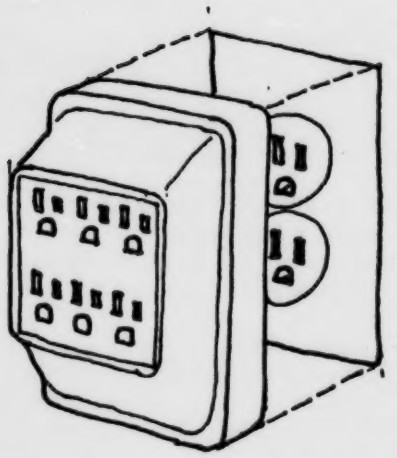


(2) Typical height of centerline of circuit breaker



(3) Typical height of low amperage wall plug

(4) Where additional outlets are required, install a simple attachment which can expand from two to six plug openings (such as Leviton cat.no. 600 15A - 125 v, approximately $5.00. Unlike some other multiplug arrangements, this compact simple device conveniently has all of its six sets of openings visible and accessible on the front face.



(4) Multiplug extension

3.2.3 Major Appliances

Most kitchens contain three or more major appliances, which are large and heavy and are usually permanently installed in a particular location. They include a refrigerator-freezer; a range oven or cooktop with a separate built-in oven; a single or double sink, often with a built-in waste disposer; and a dishwasher, which is often built-in beside the sink. For seniors, these major appliances are important personal energy savers.

This subsection identifies some important features of major kitchen appliances; as well as the manufacturers or suppliers and approximate prices.

(1) Refrigerator-Freezer

(i) Position the refrigerator-freezer within the kitchen so that it is convenient to both the sink and the stove. As a useful rule of thumb, the circulation path between the sink, the refrigerator and the stove or range top should form a triangle.

(ii) Other food storage arrangements which improve access and reduce the necessity for bending or reaching include

rotating lazy susan trays. They can be attached to the shelves of the refrigerator (Rubbermaid Models 2936 and 2937, approximately $4.00 and $6.00 respectively and make it easier for seniors to reach small containers. (Similar turntables can also be used within kitchen cabinets.)

(iii) The freezer is another important food-storage area and can be made readily-accessible to physically impaired seniors. Use a reaching aid (page 43) to help store heavy freezer bags which have been marked and tied with wire or plastic bag ties. Using different coloured bags and containers will help identify stored foods in areas which are otherwise hard to reach and often poorly lighted.

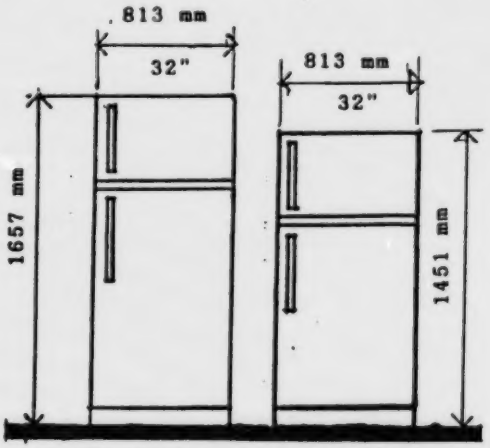
When selecting a new refrigerator the following hints may be helpful:

(i) Choose a frost-free refrigerator-freezer to save time and personal energy.

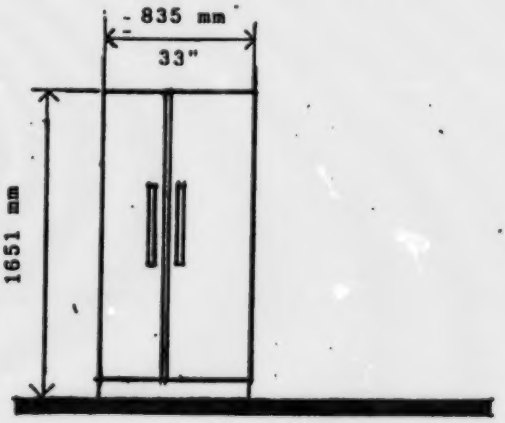
(ii) Select a refrigerator-freezer that features side-by-side refrigerator freezer spaces.

(iii) If a top/bottom refrigerator-freezer is used, the top of the freezer unit should be as low as possible so that it is easier for a short or seated person to reach food. The Inglis INT 32000-390 litre (13.8 cu. ft.) model is only 1451 mm (57 1/8") high.

(iv) In kitchens designed for barrier-free access, duplex (side-by-side) refrigerator-freezers are recommended. Although they are slightly more expensive than top/bottom units, duplex models have much better access and greater freezer capacity for approximately the same size model. The freezer compartment of an Inglis INS 18000 (duplex)



Top/bottom refrigerator-freezer
484 litre **330 litre**



Duplex side-by-side refrigerator freezer

side-by-side model has a capacity of 156 litres (5.5 ft.3) compared to 125 litres (4.4 ft.3) for the largest top/bottom units from the same manufacturer.

(2) Sinks

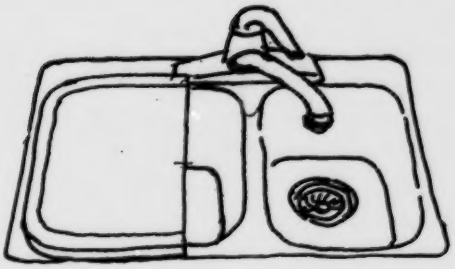
There are several simple features which can be installed in existing kitchens to make using the sink more convenient for seniors:

(i) Obtain a simple cutting board to fit over half the sink. This can make washing and preparing food more convenient.

(ii) Replace standard sink taps with lever type tap handles (or lever adapters). If lever type tap handles are not available consider installing a single-lever swing faucet. The American Standard Aquarian 4200 series cost approximately $40.00; the Waltec and Delta single control faucets are also convenient to use.

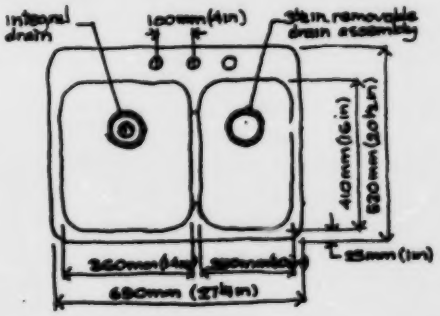
(iii) Install a double bowl sink for flexible food preparation. Several models are available including the American Standard Prestige Model AE-1223 (approximately $100.00) and the Waltec Model CCL2027 BF. Stainless steel sinks are easiest to keep clean and will not chip or rust.

(iv) Consider installing a shallower sink for wheel-chair-bound seniors. It is easier to clean and provides more legroom under the sink.



(i) Cutting board over sink

(ii) Lever type faucets



(iii) Double bowl sink

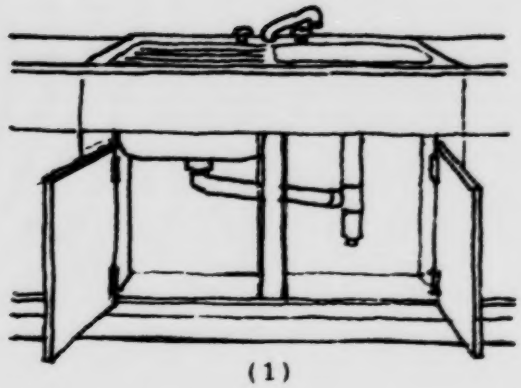
(v) To keep the sink area barrier-free, lower the counters around the sink from 900 mm to 840 mm (max.). Make sure that there is sufficient clearance to fit a chair or wheelchair to allow seniors to work comfortably at the sink.

The adjacent sketches show steps to improve access to an existing sink for a senior in a chair or wheelchair:

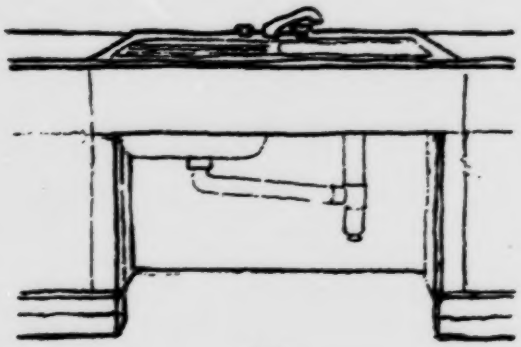
(i) Remove the sub-base of the kitchen cabinet and the vertical strip, if one exists (1). Reinforce counter edge if required. Where under-the-counter doors present a problem, remove them (2). Replace them with a simple curtain of bamboo or other flexible screening material (3).

(ii) Adjust the piping under the sink to provide maximum clearance. An important safety consideration is to insulate or cover the area beneath the sink, hot water pipes, drains and the sink wall. This will protect a seated person against burns or discomfort from excessive heat.

(iii) Alternatively, build a new cabinet enclosure under the sink to increase leg room. This will also provide easier access to the piping and give a small amount of useful storage. Select a sink design with the drainhole as far as possible back from the edge of the countertop. This will reduce obstructions and increase leg room.



(1)



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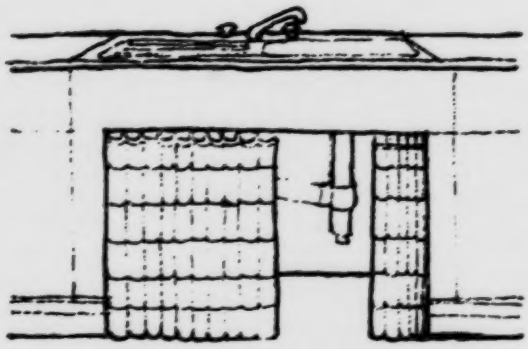
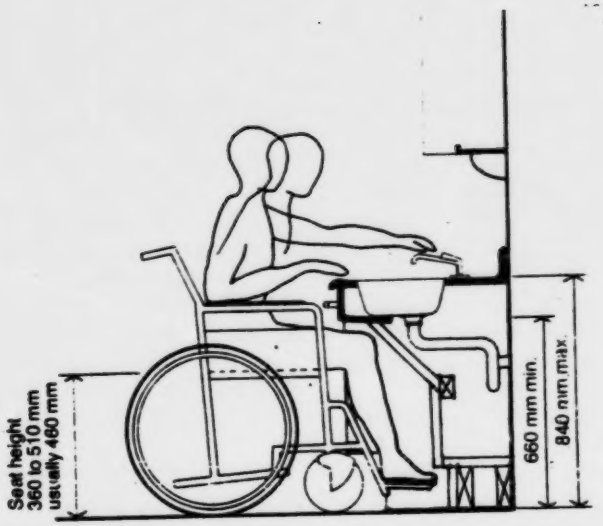


(3)

Improving access beneath kitchen sink for wheelchair user



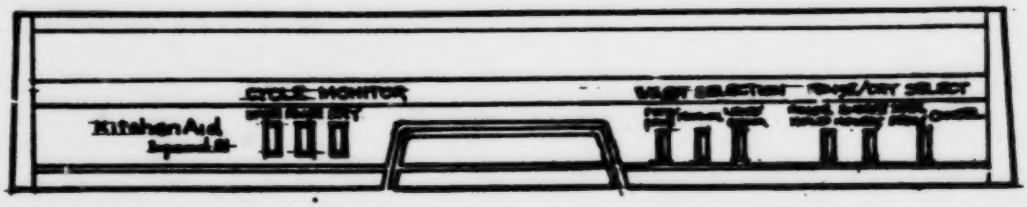
(iii) Section through kitchen sink

(3) Dishwasher

A built-in dishwasher is recommended for seniors with reduced physical energy.

(i) Select a dishwasher with controls and dials that are clear and easy to operate. For people with limited hand or wrist strength, computer touch controls or push buttons will eliminate grasping or twisting knobs or dials. Consider Maytag Models WU 1000 and 902 or the Kitchen Aid Model KDI-21AC.

(ii) Place the dishwasher next to the sink to simplify plumbing connections and make washing up more convenient. A built-in dishwasher may limit counter height around a kitchen sink. While most dishwashers can be adjusted slightly, they require a counter height of 900 mm (36").



Kitchen Aid push button dishwasher control

(4) Food Waste Disposers

A food waste disposer saves energy by reducing the number of times per week that kitchen garbage must be removed. The food dispenser also makes it easy to grind and flush most wet food waste safely down the drain.

Food waste disposers are either batch-feed or continuous-feed type appliances. Continuous-feed units constantly process wastes. A toggle switch, located under or near the sink, controls the continuous-feed machine.

Batch-feed appliances use an automatic lid over the sink drain itself as the starting device. Batch-feed appliances are recommended because of their greater safety and lower energy consumption. (Consider Maytag Model FB10 - approximately $256.)

(5) Stoves, Cooktop Surfaces and Wall Ovens

(i) Stoves and cooktops should not be placed directly next to a window or an outside door. Provide a range hood with a light and a ventilating fan over the cooking area.

(ii) The controls for stoves and cooktops should be near the edge of the counter, as they are on the GE Calrod type cooktop with side controls, (approximately $400.) Range controls should have safety-lock knobs to avoid tampering by young children.

(iii) Ensure that oven and rangetop controls are easy to read and use.

(iv) Ensure that the circuit breaker which controls electricity to the stove is easy to reach from the kitchen area. Also ensure that an ABC-type dry chemical fire extinguisher is nearby.

(v) For hearing-impaired people, install a visual timer device by the stove or oven instead of the commonly used bell or buzzer. A flashing light timer or similar indicator can be installed by a qualified electrician and/or electronics firm.

(vi) For wheelchair-bound people who find the height of a normal stove difficult to cope with, a separate cook-top surface and wall mounted oven are recommended. Although separate cook-top and oven components are more expensive than conventional stoves, they offer greater convenience and flexibility if kitchen arrangements and are easier to maintain. Cook-top surfaces which fit flush with the countertop, and wall ovens with side-opening doors, can be installed at heights which are more comfortable for seated persons. In Canada, only White Westinghouse manufactures a wall-oven unit with side opening doors.

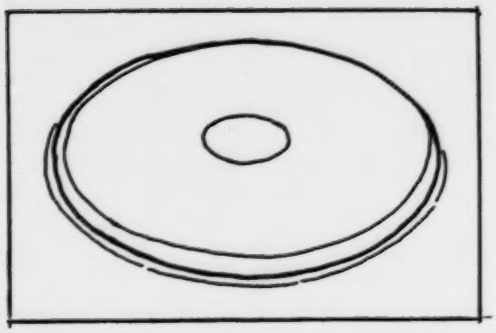
(vii) Electric elements are the safest and most efficient cooking surfaces for stoves and cooktops.

These may be either calrod, solid flat plate, or induction type. Each has its own unique operating characteristics.

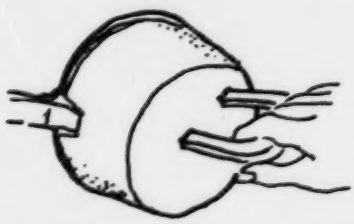
Calrod elements, the most common, offer economical thermally-efficient and flexible heating units. However, they do not have automatic devices to protect against overheating pots, etc., nor do they provide as even a heat surface as flat-plate elements.

Flat-plate heating elements offer a smoother and more even-cooking surface. However, they take longer to heat up and cool down. Flat-plate heating elements have an advantage of built-in temperature limiters, which helps protect against excessive heat to cookware. If a pot accidently boils dry, the heat is reduced automatically, preventing further damage. Flat-plate cooking elements are 25-30 percent more expensive than calrod type elements. Both calrod and flat-plate elements are available for both range and counter cooktop installations.

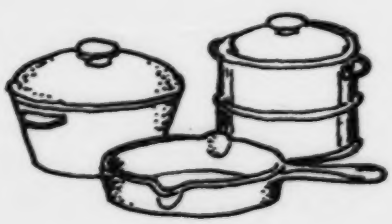
Induction cooktops are different from conventional heating elements because they do not heat up. Instead, they use a magnetic field formed between a steel or iron pot and the stove surface to turn the pot itself into a heating element. As a result, cooking speed is rapidly increased. Water can be boiled in steel or cast iron frypans or pots within a few seconds on an induction range.



Flat plate heating element



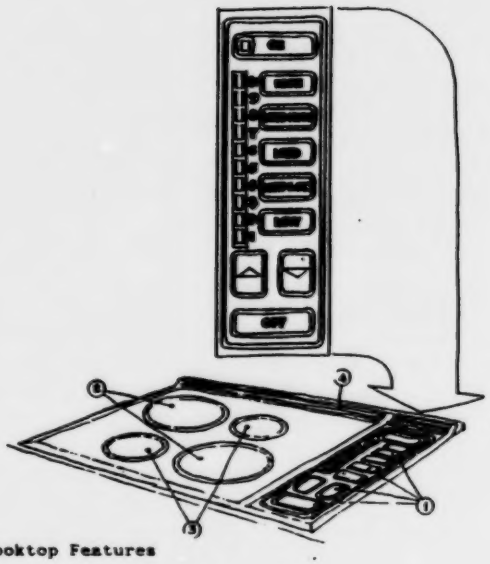
For induction cooktops use only magnetic stainless steel, enameled steel, cast iron or combinations of these



Perhaps the greatest advantage induction cooking offers , aside from speed, is safety. Because the cooktop never heats up, it is impossible to ignite clothing or burn skin by accidently touching a hot cooktop. Flammable substances, such as oil or fat, heated on a cooktop cannot be ignited by accidently touching a red-hot stove element and spreading the flames.

Induction cooktops also have the advantage of automatic shut off. When a pot or pan is removed from the stove, or if a pot boils dry, the cooktop turns off automatically.

Not only are induction cooktops limited to the use of iron or steel flat bottom pots, they are also costly. A G.E. Model JP-688 is approximately $1600, four times the cost of a conventional G.E. Calrod element burner cooktop, which sells for approximately $400.



Cooktop Features

1. Electronic Touch Control Panels
2. 8" Induction Cooking Units
3. 6" Induction Cooking Units
   Match the size of pan to size of cooking area
4. Air Vents
   Fan in Unit pulls in room to keep induction units cool

G.E. Model JP - 688
induction cooktop

3.2.4 Minor Appliances

Seniors often find that minor appliances can significantly assist in food preparation. These minor appliances such as electric can openers, blenders, food mixers, toaster ovens, and microwaves, can reduce the effort and manual strength required to lift, twist, open, blend, carry chop, mix or clean various components in the kitchen.

Electric Can Openers

An electric can opener is most useful for seniors who find it difficult to puncture a can, twist the handle of a manual can opener, and safely remove the tin lid. The electric opener is faster, physically effortless, and reduces the dangers of cuts by magnetically lifting the lid from the can as it is opened. (See Phillips Model KB5722, approximately $19).

For seniors who have the use of only one hand, several fixed or portable can openers are available. Bisell-Sammons Canada (BSC) supply a free standing model, BK-3050; a wall-

mounted unit, BK-3048; and a portable unit, BK-3049.

Blenders, Liquifiers and Food Processors

A variety of food blenders and liquifiers are available for blending and mixing food. These appliances are particularly helpful to seniors with chewing difficulties. Conventional multispeed food blenders include the Osterizer 14 speed model with a 6 ampere motor. For approximately $65, it is available from many small-appliance outlets. More powerful units include the Oster commercial liquifier model 352. For approximately $180, it is available from Natural Health Equipment, Kelowna, B.C.

There are a variety of food processors available. These include the Oster 5-in-1 kitchen centre at approximately $250; the Cuisinart at $160; the Braun at approximately $110; and the Black and Decker at approximately $65. All are available from normal retail outlets.

Toaster Ovens

Conventional kitchen ranges and wall ovens often generate a large quantity of heat for the amount of food thay can cook, often at most for only one or two persons. They are also often difficult to wire without an electrician. An efficient and convenient alternative for many seniors is a countertop or tabletop toaster oven.

Sometimes called a toaster range, this relatively low cost, portable, easily maintained oven can do a number of small scale heating tasks more efficiently than a large conventional range. Toaster ovens can defrost, toast, broil, cook and bake food. One example, the Phillips toaster range, model 7R4408C, costs approximately $60 and is available from many kitchen-appliance dealers in Alberta.

Microwave Ovens

A table top microwave oven is another compact, convenient and energy-efficient device for rapid cooking or reheating food. Microwave ovens are available in a number of sizes and can be installed on a table or countertop, or under a counter. Depending upon the size and specifications, prices range from $230 for a small .5 cu. ft. under-counter model, such as Sanyo, to more than $800 for a full-size countertop model, such as a 1.5 cu. ft. Panasonic or General Electric.

With push-button side opening doors and finger tip touch controls, microwaves are easy to use for many seniors with physical difficulties.

3.2.5 Special Aids

A variety of other special kitchen aids are available to assist seniors to sit at counters, move around the

kitchen, open containers, hold objects which they are cutting, and reach hard-to-reach objects. The following are some useful aids:

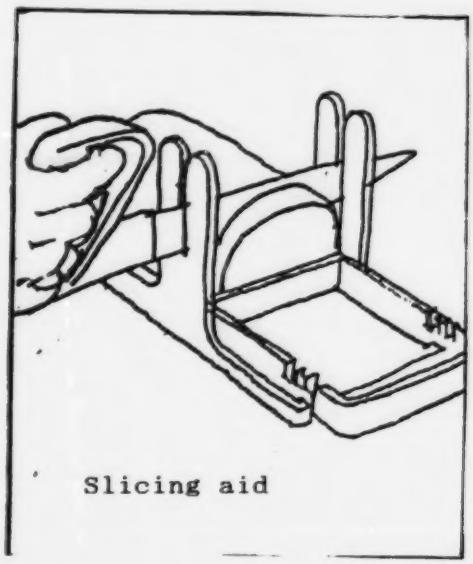
Mobile Stools or Chairs

For an ambulant senior who cannot stand for any length of time, an adjustable mobile chair or stool is very useful. A lightweight mobile stool will remove up to 90% of a person's weight from the legs and feet and allows the person to remain in a near-standing position. Padded stools which can be adjusted from 675 - 875 mm (27"-34") are also available. The EZ Stand Mobile Stool, approximately $180 is available from BSC, BK-3250.

Alternatively, conventional swivel chairs are available. They also feature adjustable height, padded seats, and are often based on more stable four or five legs with detachable rollers. For example, the Cento Swivel Chair with Cento casters and detachable arm rests is available from IKEA stores in Edmonton or Calgary for $168.

Holding Devices

A useful kitchen aid to assist disabled seniors is the Swedish Paring Board. The device is designed to hold bowls for stirring, boxes and jars for opening, or solid food, such as meat, fruits or vegetables, for slicing or grating. The device uses a combination of adjustable jaws and pins to secure objects. It also has suction-cup feet which can clamp onto a smooth countertop or table surface. For approximately $120, it is also available from BSC, BK-3022.



Slicing aid

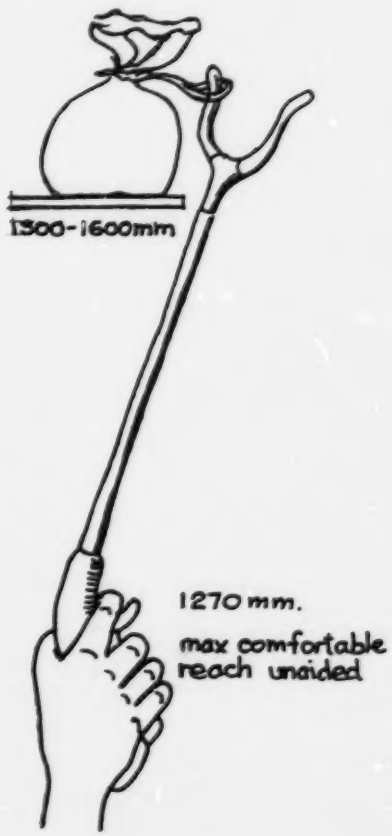
A number of other kitchen aids are available for opening jars or other containers single-handedly. The Handigrip jar wrench is available from BSC, BK-3082, for about $7. It increases the leverage and holding power of a single hand in order to help open jars or other containers which have been clamped to a board or counter. Several other types of wall mounted or undercounter mounted jar openers are also available from BSC for approximately $17.

Reaching Devices

Reachers which grab and hold hard-to-reach objects in kitchen cabinets, refrigerators and ovens are also very helpful to seniors with limited extension. An elongated spatula, commonly used for outdoor barbeques, can assist a wheel-chair-bound senior to reach into a deep oven or cabinet. At approximately $5, these spatulas are available from most large hardware outlets. An oven shovel (commercial pizza shovel) can also assist a disabled senior extract objects safely from a hot oven and thus prevent burns or other hazards. This device is available from BSC, BK-3445, for about $27. BSC also make $15 kitchen tongs which cannot slip off the wrist. They range in length from 11" - 27"; very little squeezing and finger pressure is needed to operate them.

Reachers are also available with different holding and/or grabbing capabilities. Some BeOK models have simple trigger-action piston grips. At approximately $16 - $18, they are available from BSC, 6107 - 6103, as are other lightweight trigger-action reachers, such as the Pistol grip reacher. This device requires minimal finger strength to copy the grip of a human hand. The Pistol grip reacher has a delicate enough touch that it can gently lift and move crystal glassware and other fragile objects from shelves or counters. The BK-6011 sells for approximately $167.

Two-handed reachers are also available from BSC, 6104 for about $25. The BeOK retainer reacher is held in one hand with its lever action controlled by the other. Some two-handed reachers have a spur to pull or push objects, as does the Handbill reacher. It is also available through BSC, 6424, for about $23.



Pistol grip reacher

Some reachers are attached directly to a senior's arm and augment the reaching capability of a person who cannot use his or her fingers, as in the case with people with spinal injuries or severe arthritis. The C-5 Reacher, available from BSC, BK-6417 for approximately $170, has an attached cord or lever device, which the person operates with his/her opposite hand.

3.3 THE BATHROOM

The bathroom is a small but very important room in the home which needs special attention for seniors. Accidents such as falling, scalding or taking the wrong medicine are most likely to happen here. These accidents are caused by respectively, slippery bathtubs or bathroom floors, toilets which are difficult to use and poor lighting. Often a few simple changes are all that are needed to make a bathroom safer and more comfortable. Aids such as grab bars, lever faucet handles, better lighting, or an emergency calling system can be put in with little effort and little expense. However, when people use special equipment such as crutches, walkers and wheelchairs, more extensive changes may be needed in the overall design of the bathroom.

If there is more than one bathroom in a home, consider altering, at least, the largest and most convenient bathroom to make it safe and easy for wheelchair or walker users.

3.3.1 Organization of Space and Clearances

In most homes, bathrooms are very small. Some are as small as 1500 mm x 2400 mm (5' x 8'), which is too small for those who use a wheelchair or walker.

Regardless of their physical difficulties, seniors must be able to use bathrooms easily. A person in a wheelchair must be able to turn around and get close to the tub, toilet or laundry equipment if laundry facilities are located in the same room. A person must also be able to get a wheelchair under the sink; larger spaces are needed to move about. Figures 17 through 19, Pages 45, 46 and 47, illustrate a basic bathroom floor plan and show how it may be modified to accommodate seniors who use wheelchairs or walkers.

Legend

1. Wall hung toilet
2. Sliding door to hallway
3. Light over vanity
4. Mirror over vanity
5. Single lever faucet
6. Clear space under sink for seated person
7. 1500 mm (5') turning circle for wheelchair
8. Shockproof receptacle
9. Drawers under vanity
10. Grab bar around tub

Figure 17: INTERIOR OF A BATHROOM MODIFIED FOR WHEELCHAIR ACCESS

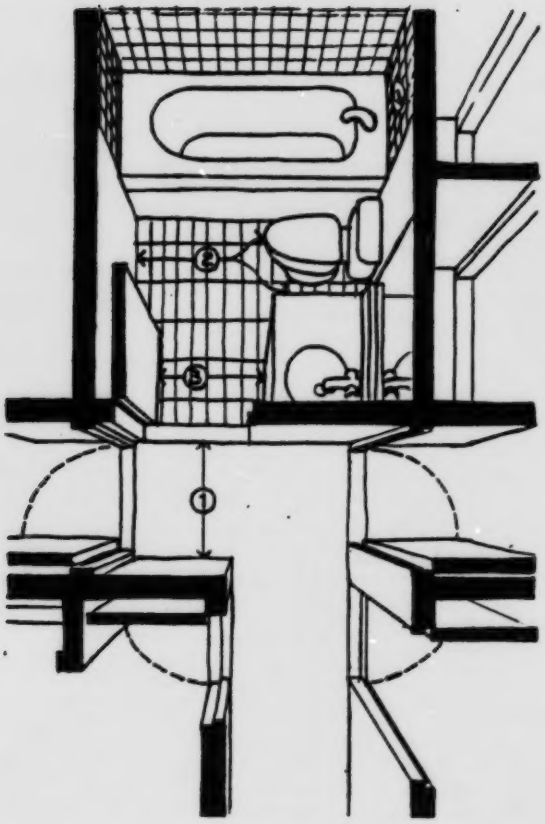


Figure 18: PLAN OF A TYPICAL BATHROOM FOR AN AMBULANT SENIOR

The bathroom and entrance area in this plan are adequate for ambulant persons but are too small to accommodate a wheelchair. For example:

(1) the hallway to the bathroom is too narrow to turn a wheelchair (e.g. 3');

(2) within the bathroom, there is insufficient clear space beside the toilet or bathtub to get a wheelchair close enough for lateral transfer;

(3) there is insufficient clear space in front of the sink to turn a wheelchair or roll it underneath the sink (e.g. less than 3').

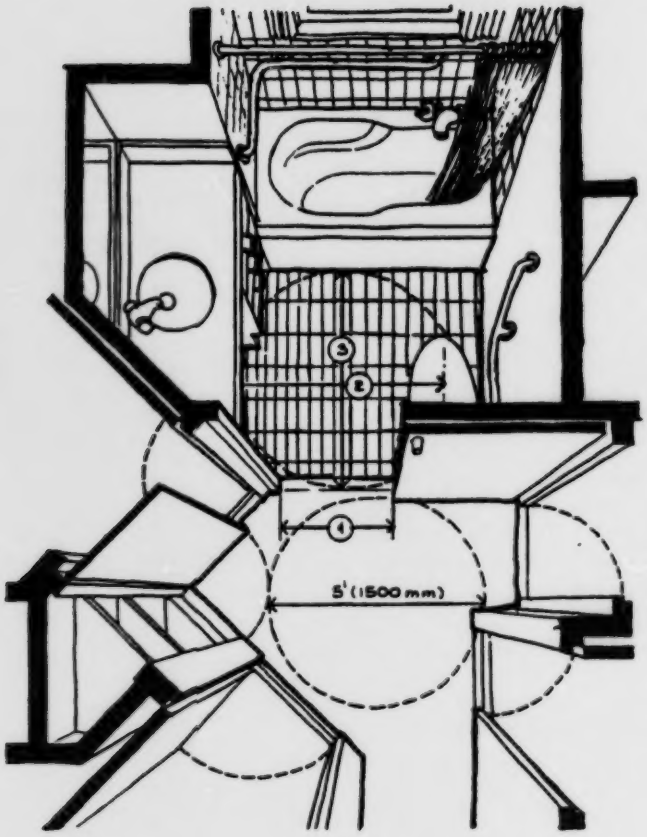


Figure 19: PLAN OF A TYPICAL BATHROOM MODIFIED FOR WHEELCHAIR ACCESS

For this modified plan, enlarge the space in the hallway to the bedroom area and bathroom to improve access and circulation for wheelchair-dependent persons. For example:

(1) enlarge the bathroom-door opening and provide a sliding door wide enough for wheelchair access (e.g. 810 mm (2'-8"));

(2) widen the bathroom interior sufficiently to turn a wheelchair in front of the sink (e.g. 1524 mm (5'));

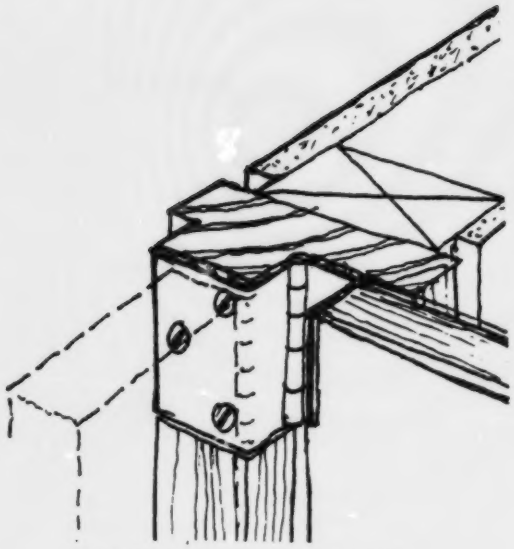
(3) leave sufficient space within the bathroom to transfer to the toilet and into the bathtub from a wheelchair (e.g. 1250 mm (4'-2")).

3.3.2 Construction Details

The Bathroom Door

Provide a barrier-free bathroom door opening of at least 760 mm for a wheelchair. It is essential that the bathroom door be able to open to the outside in an emergency. Since it is often difficult to open a bathroom door outward into a narrow residential hall, a sliding door is a recommended alternative.

Foldback hinges can replace conventional door hinges and increase door width the thickness of the door without changing frame size.



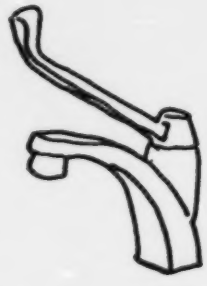
Foldback door hinge

The Bathroom Interior

The following changes are recommended to bathrooms:

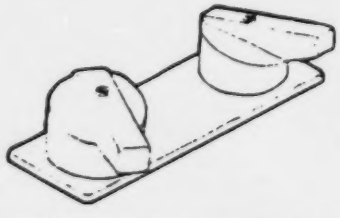
(1) Areas of the bathroom around the bathtub, toilet and sink should be well lighted.

When no direct light shines over the bathtub, translucent shower curtains allow as much light as possible from the room into the shower/bath area.



Single lever faucet

(2) Provide taps, levers and handles on bathroom fixtures which are easy to operate with one hand. The Moen Chateau Series 4943 lever handles, cost approximately $78, while Aqua single handle sell for approximately $53 and are available from most plumbing suppliers.



Faucets with lever handle

(3) Provide enough space under the bathroom sink for

a wheelchair to fit comfortably and, at the same time, a comfortable countertop height for a person in a wheelchair to use.

Provide a space next to the toilet which is large enough to park a wheelchair. A minimum of 940 mm (38") is essential for this purpose.

(4) Provide shock protection for switches and bathroom-wall receptacles, in accordance with the requirements of the Alberta Building Code. Shockproof ground fault interrupter (GFI) receptacles are available from most large electrical (parts) outlets in Alberta.

(5) Install a plate glass mirror over vanity areas along at least one wall. For wheelchair-accessible bathrooms, the base of the mirror panel should be a maximum of 1000 mm above the floor. If it is higher, tilt the mirror downward so that it can be used by a seated person.

(6) Provide a ventilator fan and/or a radiant heat lamp in the ceiling of the bathroom. The Broan SKU-602554 heat lamp-ventilator fan costs approximately $52.

(7) Where space permits, install laundry equipment within or next to the bathroom. The washer and dryer side-by-side will require a space of 137 cm (54") wide and 72 cm (27.5") deep. If the senior cannot use the storage shelving over the laundry equipment, additional cabinet storage measuring 60 cm (24") wide may be required.

If a bathroom is being enlarged to accommodate a washer and dryer, install a new floor drain.

3.3.3 Major Fixtures

3.3.3.1 The Bath

If a bathroom is to be made wheelchair accessible, existing fixtures may need to be relocated. However, bath units are difficult and costly to replace. Therefore, every effort should be made to refrain from moving the existing bath if it is still in good condition and accessible. The following are basic requirements for seniors' baths:

(1) Surfaces

A tub with a reasonably flat bottom and a slip-resistant surface is essential. Existing tubs may be upgraded with rubberized adhesive non-slip tape. It should run lengthwise along the bottom of the bathtub. Non-slip tape is available in various widths from Healthcare and Rehabilitation Specialties (HRS), Edmonton, Alberta, and ranges in price from $2 a roll to $10 for a package.

(2) Depth

Many seniors find shallower tub designs easier to use: 356 mm (14") high.

(3) Transfer Bench

Seniors who are unable to

sit comfortably in the bottom of a tub may need a bath seat or transfer bench to help them get in and out of the tub from a wheelchair. This aid can be placed either within the tub or can be clamped over the edge. For persons who wish to sit above the tub as they shower, a padded transfer seat, like the Guardian model number 28015 which sells for approximately $260, may be helpful.

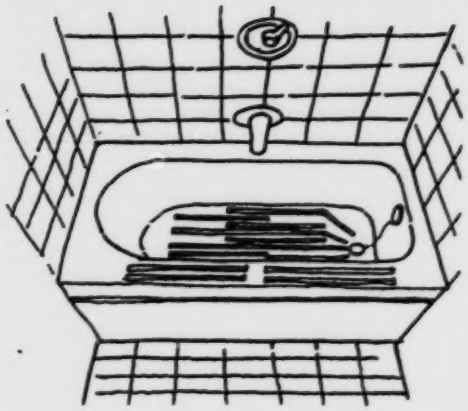
(4) Tub Lifts

In addition to grab rails and transfer benches, hydraulic-lifting devices also assist seniors to get in and out of the bath. The Nolan Tub Lift is a chair lift which operates by the water pressure from a shower hose. This lift is available from HRS in Edmonton and costs approximately $650.

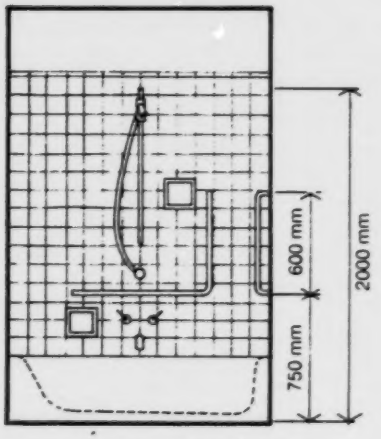
(5) Grab Bar

For ambulant seniors who only require something to hold onto as they get in and out of the tub, attach grab bars to walls and/or floors, or wedge a vertical support pole between the bathroom floor and the ceiling, close to the edge of the tub. The Guardian Safe-T-Pole Model 98120 is approximately $110. A grab rail can also be clamped to the side of the tub. The Guardian-Tub Bar No. 92005 costs approximately $100.

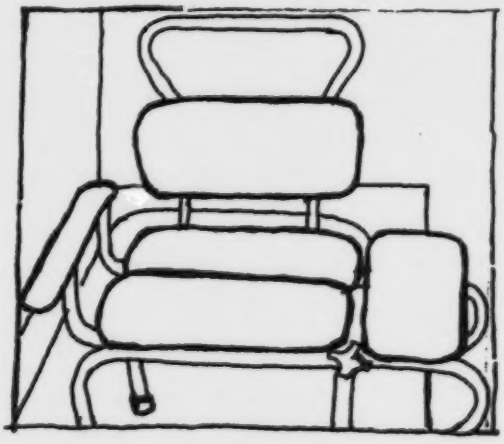
Tubs with a wider recess at one end, such as Sommerset, are also available with built-in handles or grab bars to help seniors pull



Tub with rubberized tape



Bathtub elevation



Guardian padded transfer seat

themselves upright.

(6) Wall Mounted Accessories

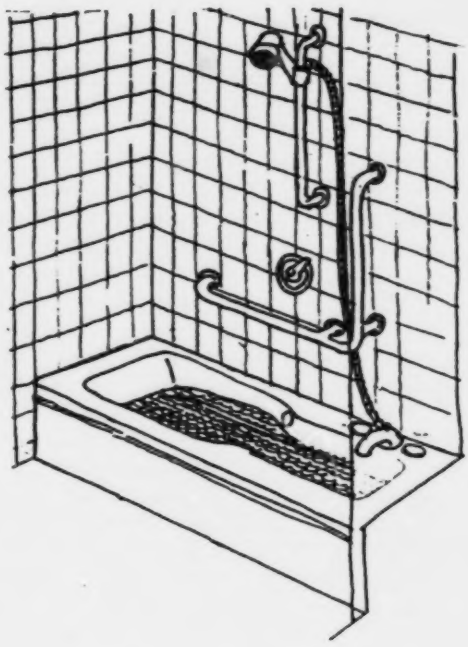
Do not place towel bars, soap dishes, or other wall-mounted accessories where they may be confused with grab bars or hand rails. Ensure that all wall-mounted accessories or grab bars that a senior might reach for in an emergency are designed to sustain a momentary load of up to 113 kilograms (249 lbs.). If they are not, remove them. For the same reason, securely mount wall mounted-countertops and sinks.

(7) Faucet Position

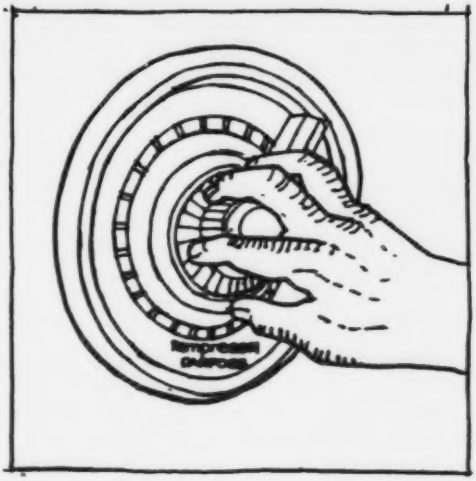
Consider moving faucets from the end wall to the side wall of the tub. Some tubs come with holes to install faucets in the side, such as Crane Lite-line and Empress Model Series which sell for approximately $652 and Sommerset for $313. For many seniors, side-tub faucets offer an advantage of close control of the water taps, without excessive bending or reaching.

(8) Thermostatic Mixing Valve

To avoid accidental scalding in bathtubs and showers, a thermally controlled pressure balancing device with an adjustable upper limit is strongly recommended. The Moen Model 3270 costs approximately $118 and the Danfoss Tempress II Model costs about $90.



Tub with adjustable shower and single waterflow control



Thermostatic mixing valve

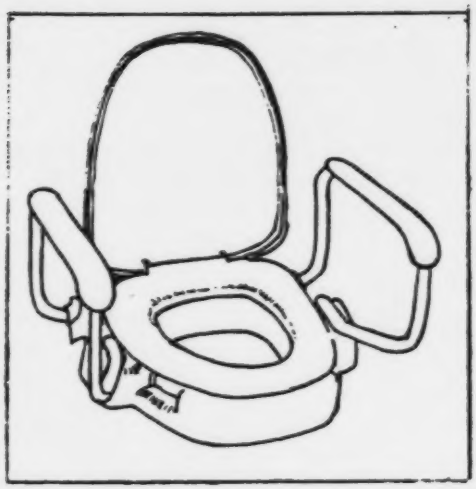
3.3.3.2 Toilet

Toilet seats are a problem for seniors who have difficulty standing up from a seated position, or sitting down from a standing position, particularly when a seat is low. Ensure that toilet seats are available at a convenient height and that grab bars, rails or other supports are available. The following are also useful guidelines for toilet arrangements in seniors' homes:

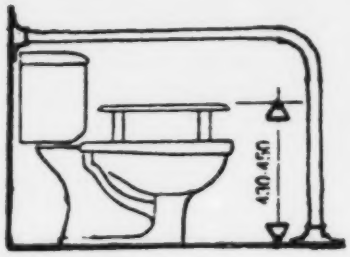
(1) Provide toilet seats at appropriate heights. For example, raise the toilet seat for a senior who uses a wheelchair to a level equal to the height of the seat of the wheelchair. Toilet seats can be raised in one of the following ways:

(i) Attach a removable raised toilet-seat commode to the existing toilet to replace the old seat. The approximate price range of raised seats is $48-$190, depending on detail design and specifications.

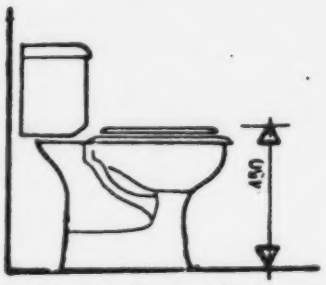
(ii) Install a higher than-normal-height toilet. This can be either a unit which extends out from the wall, such as the Crane Cavalier model, or a unit which sits on the floor, such as the Crane New Hymond model, which is raised 450 mm (18") from the floor and costs approximately $395. Compared to the special toilet, a conventional toilet measures 375 mm (15") above the floor and costs approximately $120.



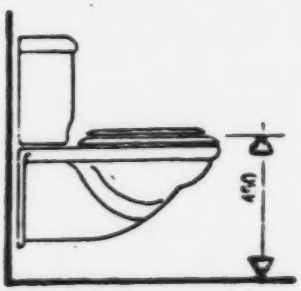
Toilet seat raiser



(i) toilet seat commode



(ii) higher than normal toilet



cantilever toilet mounted high

Modified toilet seat heights

(2) For a wheelchair-bound senior, provide arm rests for toilet seats. These can either swing out from, or down from, the wall behind the toilet or can be designed to be detached from the toilet seat itself. The Optima 3 swing arm rest, approximately $170, swings out from the wall and stores flush with the wall when not in use. The Optima 1, approximately $125, is a swing-down floor supported arm rest attached to the wall with a reinforced wall bracket. The RFSU-raised toilet seat attachment, approximately $350, comes with removable arm rests. All of these Swedish design toilet seat aids are available from HRS, Edmonton.

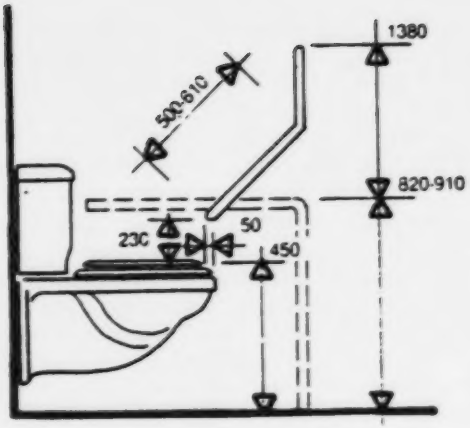
(3) Provide wall and/or floor-mounted grab rails within easy reach of a person seated on the toilet. Anchor the grab rails securely into a wall or into the floor. See Section 3.3.4 for further details.

(4) Ensure that toilet-paper dispensers and an emergency call button can be easily reached from the toilet seat.

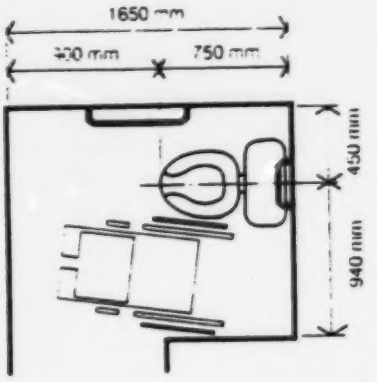
3.3.3.3 The Bathroom Sink

Many of the difficulties in accessibility and space already stated about kitchen sinks also pertain to bathroom sinks. (Refer back to pages 35 - 36).

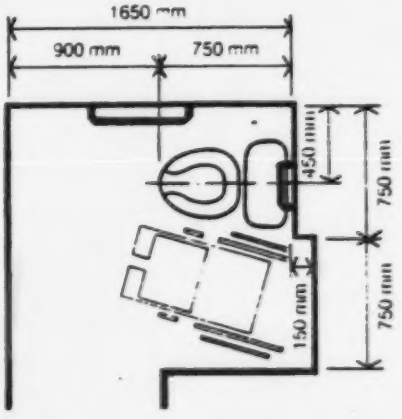
For a senior confined to a wheelchair, it is important that sink or countertop designs allow a wheelchair



(iv) Alternate grab bars adjacent to toilet



Minimum access area for side entry



Preferred access area for lateral transfer

to get under the sink and provide sufficient space to permit the chair to turn in front of the sink.

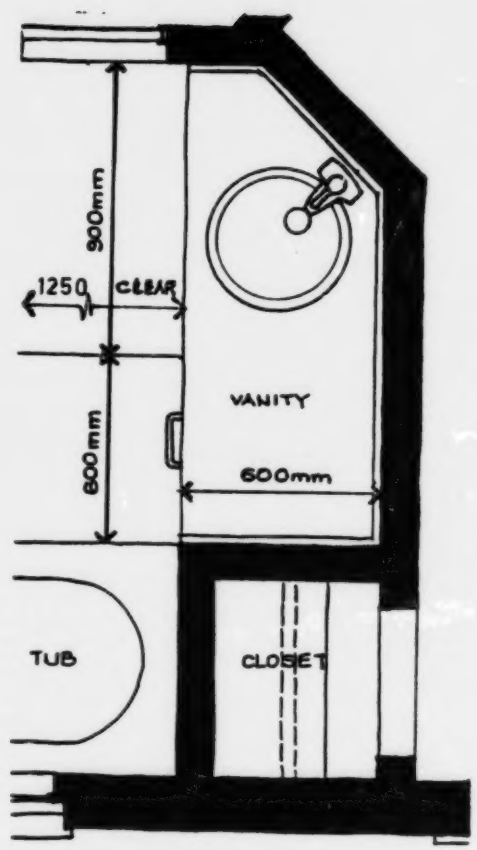
(1) A shallow sink with a larger vanity area can help overcome lack of wheelchair clearance. For a wheelchair-accessible arrangement, install a shallow sink in a 900 mm x 600 mm (3' x 2') vanity counter. By leaving more than 600 mm of clear space under the counter as shown, a small amount of storage, 300 x 600 mm (1' x 2') is provided within the vanity as well as usable countertop area.

(2) For barrier-free sink arrangements, provide a minimum clear space of 1250 mm (50") to allow a wheelchair to turn a right angle (90 degrees) and move in under a sink or vanity. To allow a complete wheelchair turn in front of the sink, leave a clear space of 1500 (5').

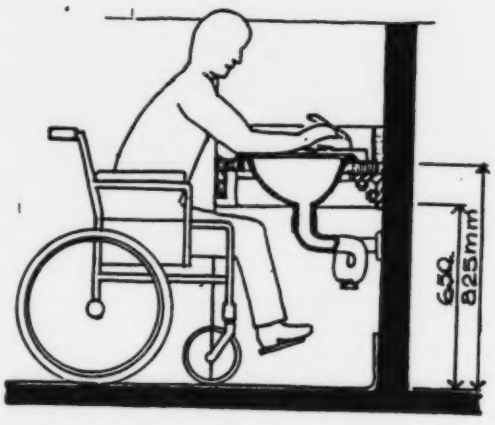
(3) Ensure that the vanity cabinet or other support for a sink as well as the sink itself is strong enough to support the weight of a 113 kg (approximately 250 lbs.) person in an emergency.

3.3.4 Installing Minor Aids

As examined in the previous section, there are a variety of minor aids, such as grab bars, safety rails, vertical bars, adjustable toilet seats, and benches and transfer seats to enable physically-impaired seniors to manoeuvre about safely in their bathrooms.



Plan of vanity counter



Section through vanity

The following are some installation guidelines for grab bars:

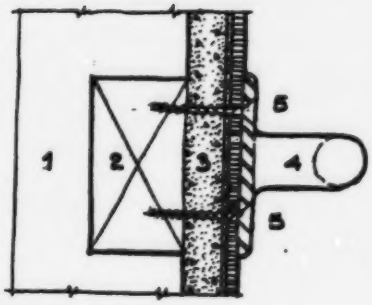
(1) Ensure that material into which supports are anchored is strong enough to carry the weight of a person twisting on the support (up to 113 kg. or 249 lbs.).

(2) Securely anchor the grab bars into a wall or floor structure, such as wall studs or floor joists. If the bar and/or plate falls between wall studs or joists, drill anchor bolts through a heavy surface-mounted panel of plywood, 18 mm (3/4") which is solidly anchored into the nearest studs. Anchor the grab bar flanges with No. 10 stainless steel or chrome-plated wooden screws, which are long enough to penetrate the wall surface and at least 18 mm (3/4") into the wood studs, or onto blocking securely anchored to the studs.

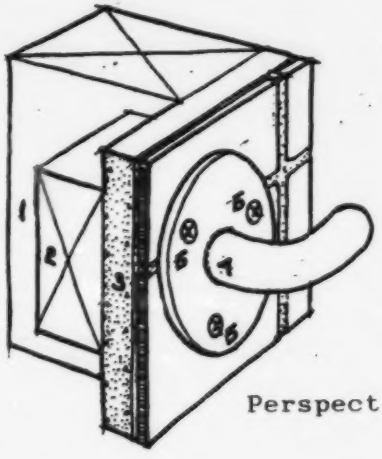
(3) In the bath area, drill holes through the ceramic tiles only where the backing behind the tiles is firm and solid, such as through 38 x 89 mm (2" x 4") studs or blocking. Unreinforced concrete board under the finished tiles is not satisfactory as support material. To drill holes in ceramic tiles, first score the hole and then drill with fine masonry bit.

(4) Do not anchor grab bars in lightly constructed (particle board) vanities.

(5) Install vertical-support pressure poles



Section



Perspective

Legend

1. Wood stud
2. Wood blocking
3. Ceramic tile on wonderboard
4. Grab bar welded flange
5. No. 10 chrome plated screws

Figure 20: MOUNTING GRAB BAR THROUGH WALL PANEL

directly under joists, beams or other solid ceiling structures. If the pole must be mounted between solid supports, use a 18 mm (3/4") plywood panel as a 150 x 300 mm (1' x 6") bearing plate to span the gap between the available supports. Where flanges on vertical poles are attached directly to the ceiling, screw through the ceiling surface and at least 18 mm (3/4") into the ceiling joists or other equally solid material.

(6) Caulk joints around the grab bar and cover the plates with a durable water-proof material. This is particularly important near bath or shower areas.

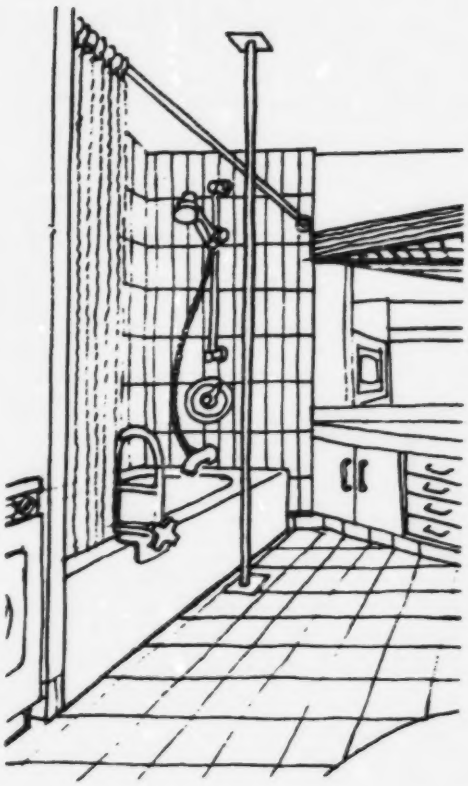
3.3.5 LAUNDRY EQUIPMENT

In most homes, laundry appliances are usually located in a utility or laundry room in a lower level or basement space. However, for seniors who have difficulty climbing stairs, washer and dryer units can sometimes be relocated on the main floor, either in a bathroom or in a separate laundry utility area.

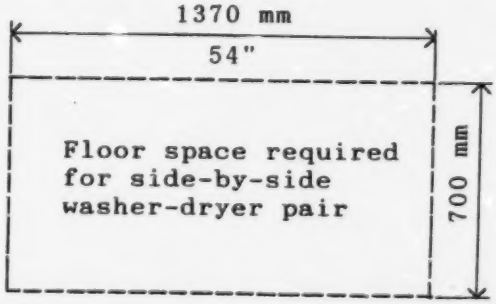
There need not be much space allotted for laundry equip-ment. All that is needed is a space which is wide enough to contain a washer and dryer placed side by side.

Consider the following when planning a laundry area:

(1) Provide space within the laundry area for a small storage cabinet. The



Bathroom interior with grab bar and vertical pole



Washer-dryer side-by-side

countertop should be 850 mm (34") or less above the floor. This cabinet should hold a laundry basket and provide a surface for laundry preparation. Shelves are useful to store detergent, bleach, and other supplies.

(2) Provide disconnect switches that are inaccessible to children. Be sure that all storage units that contain toxic substances have workable locks. IKEA sells a model in its Rationell line for approximately $22.

(3) Laundry equipment can be located in:

(i) A bathroom or a small area adjoining the bathroom. Appliances can share plumbing with other existing fixtures. Clothers dryers, however, require and outside vent. Gas dryers also require a fresh-air replacement source.

(ii) A wheelchair-accessible rear entrance or pantry area off the kitchen can be adapted into a laundry area. A common entrance area or mudroom with a floor drain and waterproof floor and baseboard can be shared with the laundry equipment.

3.3.6 Emergency Call Systems

Emergency call systems are essential for some older people when they are alone. In the bathroom, in particular, it is very important for physically impaired seniors to be able to summon help in an emergency. There are several alternatives which can be used in the bathroom:

(1) Install a buzzer which can be clearly heard throughout the home. Consider a buzzer system that might alert neighbours.

(2) Install an automatic emergency call system. This system can be either a manual emergency call push button, installed in a dry place and accessible in a seated position, or a portable pendant or other device, worn on the body.

To call for help, a senior has only to push a single button. This sends a radio signal to an automatic dialer attached to the main telephone in the home. The dialing device then automatically sends an emergency alert message to a monitoring agency where trained staff are on duty at all times and are able to get help to the senior's home promptly. These staff are often able to access the user's medical history and provide advice to an ambulance or emergency response team.

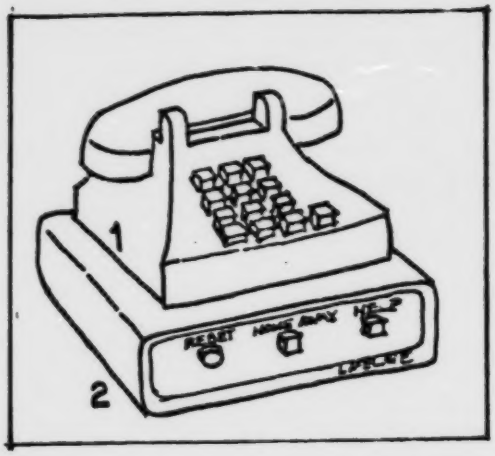
Telephone life-aid monitoring services are available from a number of private security firms. Contact ADT Systems in Calgary and Edmonton, and Lifeline Systems Canada Inc. in

Calgary; The monthly fee for this service may range from $18- $30, depending on the nature of the service required and the capital equipment installation. Emergency call services for seniors are also available through a number of agencies such as the Bethany Lifeline in Calgary and the Good Samaritan Lifeline in Edmonton.

(3) Cordless portable telephone units offer a number of advantages over conventional fixed telephones. They can be carried anywhere in or outside the home within 212 metres of the main telephone set and can be used to summon outside help in an emergency. They can also be easily hung on a wheelchair or walker. These phones may be used as a buzzer or intercom system to call someone in a different part of the house for help.

Cordless phones can be used in damp or wet places, such as bathrooms or outside, because they are powered by low-voltage battery units. However, care should be taken to avoid getting them wet in order to avoid damage to the circuitry.

Cordless phones are available from Edmonton Telephones (ET) or Alberta Government Telephones (AGT) and cost from $100 - $250. However, not all seniors are able to use cordless telephones because of their lack of dexterity and this should be considered.



Legend

1. Conventional pushbutton telephone
2. Automatic home communicator
3. Person help button (worn on the person)

Pushbutton emergency call system (Lifeline type)

3.4. SECURITY CONTROLS AND ELECTRONIC COMMUNICATIONS

Even with various aids, seniors will not be as physically independent as they might hope to be. There are, however, a variety of simple electronic controls and switches which can be used to do the following: open or lock a door; control a thermostat, fan or other ventilation equipment; monitor temperature; control lights and kitchen appliances; automatically water the lawn; or control radio and television sets. Switches can also be controlled from one or more places, either inside or outside the home, by pushing a button, or talking into or simply touching a microphone or similar device.

A small bedside-control panel can be built from off-the-shelf parts to control a variety of devices in the home. These can include electric motors for controlling doors, windows, and even drapes. The bedside-control panel can also include an emergency button to call for assistance.

The following subsections consider a number of such communication systems which are important for many seniors who are in poor health and at risk of needing help urgently.

3.4.1 The Telephone

Although most seniors in Alberta have at least one fixed telephone, it may not always be located closeby or in a location that will minimize the effort required to use the telephone. Often an existing telephone is not the right weight, shape or size for a senior to handle easily.

There are a number of variations of the available telephone equipment and related support devices. Consider the following points when leasing or purchasing telephone equipment for a senior's home:

(1) Install telephone jacks in the rooms which the person most often uses.

(2) Install waterproof jacks on outside patios or balconies, and in garages.

(3) Install jacks at a height which will reduce the need for a senior to bend when connecting or disconnecting a phone.

(4) Add longer extension cords on telephones so they reach larger areas of a room. However, take care that telephone cords are not placed in such a way they may be tripped over.

(5) As an alternative to moving telephone sets from room to room, or installing a telephone in most rooms, consider a cordless telephone unit.

cordless telephone unit. Some of the benefits of these devices have been discussed on page 58.

(6) For seniors who find it hard to hold a simple telephone, AGT, ET, and other telephone accessory suppliers offer a number of suggestions:

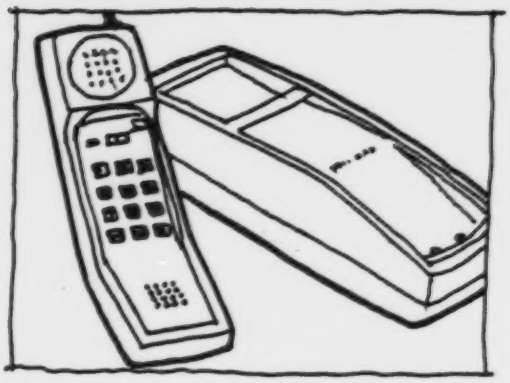
(i) Attach a shoulder bracket to the handset. This will allow a person to speak on the phone with little use of the hands. The approximate cost is $5; these brackets are available from most stationary stores.

(ii) Install lightweight handsets which are easier to hold. These can be installed on either the main phone or on an extension.

(iii) Consider push-button speaker units which attach to a conventional telephone. They allow conversation anywhere in a room without removing the receiver.

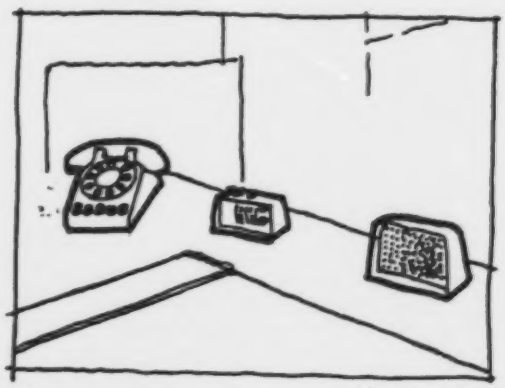
(iv) Use an earphone-speaker head set which is clipped onto the user. This rids the person of the need to hold a telephone handset.

(v) For a senior who has difficulty using hands or fingers, install a push-button phone with larger-than-usual buttons or an attachment to an existing telephone. ET and AGT offer these for approximately $7. Also available are several dialing devices. These have a memory bank which can automatically dial a range of pre-set numbers with the push of a single button or



Cordless telephone

Telephone shoulder bracket



Remote telephone speakers

number.

(vi) For hearing-impaired people, adjust the sound level on existing telephones. Alternatively, special equipment for the hearing-impaired is available from most telephone companies. For those who have sight impairments, a simple low-cost plastic ring with raised numbers and letters can be attached to dial telephones. These rings are available from ET or AGT for approximately $1.25.

(vii) AGT and ET offer special services for persons with hearing, sight, speech or motion impairments. Medically handicapped people are also exempt from operator-assisted charges. For further information, contact ET at (403) 428-3311 or their services for the Handicapped at (403) 427-2817. Message Relay Service for the Deaf is available for all other regions of Alberta by contacting AGT at (403) 425-2110.

3.4.2 Ultrasound Transmitters

Ultrasound transmitters are helpful for persons who have greatly reduced strength in their hands. A small hand-held ultrasound-unit allows a user to control at least four different power systems or appliances within a room at one time. Appliances which can be controlled in this way include electric ovens and stoves, lamps, fans, thermostats, air conditioners, humidifiers, air fresheners, motorized doors and windows, curtains and drapes, radio and T.V. equipment, computers, timing devices, entrance doors, plumbing fixtures and hair dryers. The transmitters are available in Edmonton for approximately $200. There are also transmitters available which have larger buttons, hand-held joy sticks, or mouth sticks, which are activated by blowing.

3.4.3 Mouth or Voice-Activated Controls

More elaborate than ultrasound transmitters are voice-activated control systems which use a combination of computerized devices to control a variety of mechanical systems. One such system is Butler-in-a-box, by TASH SYSTEMS. The purpose of TASH (Technical Aids for the Severely Handicapped) systems is to make available technical aids which cannot be readily obtained from other suppliers. TASH devices are also available in Edmonton.

3.4.4 System Reliability

The reader should be aware that not all emergency response systems exhibit the same levels of ruggedness and waterproofing. Many accidents occur in bathrooms; consequently, these attributes should be thoroughly investigated when selecting a unit.

CHAPTER 4

EXECUTION OF WORK

This chapter discusses three points to consider when renovating seniors' homes. These include:

(i) Zoning and by-law procedures, which must be satisfied to obtain the necessary development and construction approval.

(ii) Procedures which are required for the design of renovation work including preparation of drawings, specifications and supervision of construction.

(iii) Alternative procedures for contracting renovation work.

4.1 EXISTING ZONING AND BUILDING BYLAWS

Before commencing design or construction of any residential building or renovation in Alberta, it is important to ensure that all equipment installed, material used and design or construction which is undertaken is in accordance with municipal and provincial zoning and building construction standards. In most urban areas, development permits are not required for minor repairs or renovations of less than $500 when there are no changes affecting health and safety. No development permit is required for parking and storage arrangements as long as the structure does not abut a street.

Since many design alternatives discussed in this report involve considerations such as health, safety, and barrier-free access, and cost more than $500, applications should be made for development (zoning) and construction permits. The applications should be made to the local council or development approval authority for the district or municipality in which the residence is located. For further information on the cost of permits in different areas of the province, contact Alberta Consumer and Corporate Affairs, (403) 422-2590, Alberta Labour, Permit Enquiries, (403) 427-3393, or Buiding Standards, (403) 427-6461.

4.2 DESIGN

In order to have a specific design properly constructed, it is important to ensure that the drawings and specifications are correct.* This is important not only for communicating

* Note: The construction estimates should be within the agreed-on price range and documents should be complete and accurate.

to the builders or tradespersons what is to be done, but also to ensure that the permit is promptly approved by the respective development authorities. Ensuring the exactitude of the drawings can be done in several ways:

(1) If the work involves many different aspects of the house, an architect should be retained to prepare design drawings and specifications. For assistance in selection of an architect, contact the Alberta Association of Architects in Edmonton at (403) 432-0224. When a floor-to-floor elevator is required, a licensed mechanical engineer must be retained, either by the architect or the homeowner, to prepare and review the elevator drawings and specifications. Under subsection 3.5.5 of the Alberta Building Code, the design of elevators, dumbwaiters and escalators, particularly in regard to security and safety, must meet Section B-355 of the Canadian Standards Association governing "the Safety Code for Elevating Devices for the Handicapped," as adopted under the Elevator and Fixed Conveyances Act. Most elevator suppliers can provide the necessary structural support; however, where additional information is required, contact a mechanical engineer. A list of qualified mechanical engineers is available from the Association of Professional Engineers Geologists and Geoplysicists of Alberta (APEGGA) in Edmonton at (403) 426-3990.

(2) If the construction changes to the home are relatively modest, drawings can be prepared by an architectural technologist, a skilled draftsperson, or a professional drafting service. In this regard, care must be taken that any drawings or specifications that are prepared meet the requirements of the Alberta Building Code.

4.3 CONSTRUCTION

Once drawings and specifications are completed, and permit approval is obtained, a builder must be taken on who will carry out the contract. In this respect, the homeowner has several choices.

(1) For homeowners who are unfamiliar with construction procedures, the best alternative is to retain a small builder or general contractor to direct the construction. This is usually done on a flat fee basis, ideally by first shopping carefully for a selected contractor.

(2) A home renovation firm can also be retained to do the work. Such firms usually take responsibility for preparing necessary estimates and proposals. They then agree to carry out the work, in accordance with an agreed-upon price, using product components or equipment supplied by their own firm. While this method can sometimes be a good system for specific construction projects, such as kitchen cabinets, it may present problems. A problem that may arise is when the

firm, which is both contractor and supplier, does not give the homeowner the benefit of choosing designs and equipment from a full range of available alternatives and components, as is usually done by a general contractor or small builder.

(3) A homeowner may prefer to act as his or her own general contractor and to break down the various tasks involved in renovating his or her home by using a series of separate contractors for each task. This can be very difficult and is not recommended.

(4) Sub-contractors can be retained to complete certain portions of the work, with the homeowner and/or the homeowner's family or friends completing the remaining work as a "do-it-yourself" project.

4.4 HOW TO HIRE A CONTRACTOR

In hiring contractors, builders, or skilled trades (sub-contractors), a number of cautions should be kept in mind. The following are particularly important:

(1) Obtain price quotes from three to five contractors and do not necessarily choose the lowest price if satisfactory, quality work cannot be assured from the low bidder.

(2) Carefully check the technical qualifications and credit-worthiness of all contractors (builders) or sub-trades (sub-contractors) before deciding on anyone.

(i) Talk with previous clients of a prospective contractor or sub-trade about the past performance of the firm on work undertaken and their feelings about the firm.

(ii) Check with agencies such as the Better Business Bureau to see whether they have any complaints on file about the prospective contractor or sub-trade.

(iii) If the work is to be done on a government subsidized program, check with the program administrators to ascertain whether the contractor has successfully performed similar work in the past.

(3) Ensure that all agreements are in writing before work begins.

(4) Never advance any money before a project is started.

(5) Pay only for work that is satisfactorily completed, and retain a holdback of 15 per cent on every payment to the contractor up to 45 days after completion of the work, in accordance with the latest edition of the Alberta Builders' Lien Act.

(6) Ensure that the contractor carries adequate construction insurance. Obtain a letter from the contractor's insurer, confirming that proper insurance coverage is in place. The homeowner should also ensure that his/her own residential policy covers the residence during the construction period.

(7) If the project site is located in a small or remote community, use local labour and materials as much as possible, since transport costs for a small job can mount up.

For further information, refer to the tips factsheet published by Alberta Consumer and Corporate Affairs entitled "How to Hire a Contractor." It is available at local offices or by contacting Consumer and Corporate Affairs at (403) 427-5782 in Edmonton and (403) 297-5700 in Calgary.

CHAPTER 5

SENIORS' SUPPORT SERVICES

A number of programs are available to assist physically impaired seniors to modify their homes and medical equipment to maintain an independent lifestyle in the home. Such programs, which have financial, medical, and/or social support components, are available from a number of federal and provincial agencies. They include:

(1) Aids to Daily Living (ADL) and Extended Health Benefits (EHB);

(2) the Home Adaptation Program (HAP);

(3) the Residential Rehabilitation Assistance Program (RRAP);

(4) the Seniors' Home Improvement Program (SHIP);

(5) the Worker's Compensation Board (WCB) and

(6) Assured Income for the Severely Handicapped (AISH).

5.1 Aids to Daily Living and Extended Health Benefits (AADL/EHB) are two separate programs designed to assist physically impaired Albertans by providing basic medical equipment and other appliances which they require for more independent functioning in the home. AADL is intended to serve people up to 65 years of age, and EHB extends similar benefits to people over age 65.

The program reduces the need for costly continuing care in elaborate institutional settings by accommodating as much care as possible in the home, and maximizing the independence of people receiving such care.

Eligibility requirements under these programs are:

(a) a medical condition which results in long-term disability, chronic illness, or terminal illness;

(b) a valid Alberta Health Care Insurance Plan card;

(c) ineligibility to receive similar benefits under Worker's Compensation Board, private insurance or federal government programs.

Qualification is established by contacting a physician or health-care professional at a local health unit or hospital in a community near the person's residence. An assessment is conducted on the need for support required. Authorizers

specify the type of devices or equipment which can best meet the patient's needs.

Under the programs, benefits are available to physically impaired persons living in private homes. Approved equipment and devices which are included are bathroom aids, lifting equipment, walking aids, respiratory equipment, wheelchairs, and eating and food preparation aids.

Because physical installation in the home of AADL/EHB approved appliances and devices is not covered under this program, other programs may be combined with it, so that all or most of the installation cost is covered.

For further information contact:

Aids to Daily Living and Extended Health Benefits
Financial Building, 8th Floor
10621 - 100 Avenue
Edmonton, Alberta
T5J 3E4
Tel: 427 - 0731

5.2 The Home Adaptation Program (HAP) is designed to promote the modification of existing housing and the construction of new housing for wheelchair users. Although the program is available to homeowners, renters, and landlords, only eligibility for (older adult and senior) homeowners is discussed in this manual.

Under this program, eligible homeowners are defined as those:

> "who are wheelchair users or have wheelchair users residing in the home, and have resided in Alberta for a year prior to application, and have a current adjusted family income of less than $25,500 per year."

Assistance is provided through a $1,000 grant for a housing unit which is modified to suit the needs of the wheelchair user. Adaptations which are eligible for funding are generally limited to those which are fixed to the building or site and facilitate access or movement within the home. Applications for the program may be obtained from:

Alberta Municipal Affairs
Home Adaptation Program
Grants Administration
2nd Floor, 9925 - 107 Street
Edmonton, Alberta
T5K 2H9
Tel: 427 - 8161

Applications under HAP are also available at most health

units or hospitals within Alberta. A list of Alberta health units is provided in an appendix to this manual.

5.3 The Residential Rehabilitation Assistance Program (RRAP) allows disabled persons to remain independent in their own homes by providing financial support in the form of loans for residential adaptations to make homes more accessible. This federal program administered by Canada Mortgage and Housing Corporation has the following conditions of assistance and eligibility. The program provides for loans of up to $10,000 per homeowner who is either disabled or has a disabled spouse or other dependent family member. As much as $5,000 is forgiveable under the program, subject to a sliding income scale. Maximum forgiveness of a loan is available for a person with an income of less than $23,000. Forgiveness declines to zero at a household income of $33,000.

RRAP funding can also be combined with provincial programs such as AADC/EHB, HAP and SHIP to allow for initiation of an adaptation for a disability to be initiated under one program and completion of construction and/or installation under another. However, original documentation of details of labour and materials must be provided to the respective agencies to ensure no duplication in funding with other programs.

Further details and applications for the RRAP program may be obtained from:

Canada Mortgage and Housing Corporation
Box 1273
Suite 200, Plaza 124
10216 - 124th Street
Edmonton, Alberta
T5J - 2M8
Tel: 482 - 8700

or

Canada Mortgage and Housing Corporation
Box 2560
Suite 500
508 - 11th Avenue, S.W.
Calgary, Alberta
T2P - 2N9
Tel: 292 - 6200

5.4 The Seniors' Home Improvement Program (SHIP) Extension is intended to assist senior homeowners to repair and improve their homes. Although it is not designed specifically to serve physically impaired older adults, it is available to all senior homeowners. As such, it can be combined with other programs such as RRAP for the disabled,

HAP and AADL/EHB.

To be eligible for assistance, applicants must meet income qualifications and be at least 65 years of age, unless they are widows or widowers 55 and older. Applicants must also have lived in Alberta for at least one year prior to their application and in Canada for at least 10 years prior to the application, and be either a Canadian citizen or a landed immigrant. The home which is being improved must also be their place of residence for at least nine months each year.

The amount of the grant is determined by the total income of the applicant and spouse for the last calendar year as outlined in the following schedule:

Total Income	Amount of Grant
$17,000 or less or presently receiving the Alberta Assured Income Supplement	$ 3,000.00
$17,001 to $20,000	$ 2,000.00
$20,000 to $23,000	$ 1,000.00

Applications for this program may be obtained at most banks and treasury branches, at offices of Canada Trust and Peace Hills Trust, at regional offices of Alberta Municipal Affairs, or by contacting:

Alberta Municipal Affairs
Home Improvement Branch
11156 Jasper Avenue, Box 2453
Edmonton, Alberta
T5J -3B8
Tel: 427 - 5760

5.5 Worker's Compensation Board (WCB)

For workers, including older adult workers, the Workers' Compensation Board provides home adaptation and other assistance to people injured while working on a job. To be eligible under this program, a worker must have received a disabling injury on the job which, in the opinion of the Board and its medical assessment team, has severly limited the worker's ability to continue to work and function without appropriate aids, devices and adaptations. Once the disability is accepted, the WCB takes responsibility for any reasonable cost claims for adaptations that are submitted.

For further information contact:

Workers' Compensation Board
9912 - 107th Street
Edmonton, Alberta
T5K 1G5
Tel: 427 - 1100

5.6 Assured Income for the Severely Handicapped (AISH).

This is an income-support program which provides monthly benefits to eligible handicapped individuals who, due to severe impairment, are unable to earn a livelihood. The condition must be of permanent nature and recipients include anyone 18 to 65 years of age who is deemed unemployable.

Program benefits can be obtained by applying to a regional office of Alberta Social Services and Community Health. Provisions can also be made through this program to provide for home adaptation assistance grants as supplementary benefits, in unusual circumstances in which other programs are not available for such purposes.

In addition to these six financial and technical programs which support the adaptation of homes for physically impaired older adults and seniors, an important complementary social support program is available for health care and support services within the home.

For further information contact:

Alberta Social Services
#401 Royal LePage Building
10130 - 103 Street
Edmonton, Alberta
Tel: 422 - 3426

5.7 The Co-Ordinated Home Care Program (CHCP) offers a range of health care and support services programs within the home for qualified applicants. This program is designed to (1) improve, maintain or retard deterioration of the health status and level of independence of impaired older adults and seniors; (2) support families in caring for an ill or elderly family member in the home; and (3) prevent, delay, or reduce the need for institutionalization.

Eligibility for health care services includes all Albertans who desire such treatment while living at home, who are under the care of a physician and who are registered in the Alberta Health Care Insurance Program. Health Services include: nursing, occupational therapy, physical therapy, respiratory therapy, speech therapy, and nutritional services.

Support services include homemaking and some or all of the following: friendly visiting, handyman services, home help, meals on wheels, and transportation. They are available to a person with a medical condition who is 65 years or older, or who is the recipient of a widow's pension under the Widows Pension Act; anyone 18 years or older who is physically handicapped and living in a designated facility; or anyone who is a palliative care client, following assessment of the person's needs by a home-care assessor.

This program is important because home-care program assessors can evaluate the home environment of physically impaired people on a continuing basis to ensure that an adequate standard of care can continue to be provided in the home. Health care professionals can also monitor the effectiveness of various aids, devices, or equipment to ensure effective functioning or recommend amendments for changing patient needs.

Information about home care and related support services is available through local health units, a list of the home care managers for each health unit in Alberta is contained in the Appendix.

For further information contact:

Alberta Home Care Unit
7th Street Plaza, 7th Floor
10030 - 107th Street
Edmonton, Alberta
T5J 3E4
Tel: 427 - 4610

CONCLUSIONS

1.0 Limits

Compared with ambulant people, wheelchair dependent persons have shorter reaching arcs with smaller limits for women than for men. A variety of physical difficulties for seniors can further reduce these arcs. Reduced arcs or reaching limits affect access to storage shelves and cabinets, as well as use of a wide range of home appliances and equipment. This must be carefully considered in planning changes in seniors' homes, if access is to be barrier-free.

2.0 The Exterior of the Home

For ambulant seniors, comfortable, well-lighted stairs and other walking surfaces are very important. For seniors who use wheelchairs or walkers, at least one barrier-free access to the home is essential. This requires either a ramp, passenger elevator or wheelchair lift to ensure that everyone can reach all areas of the home.

Ramps are cheaper than elevators or lifts in moving people from one level to another. The cost of a wood or steel ramp is less than 25 percent of the cost of a wheelchair elevator, and is easier to maintain. In bad weather, however, exposed ramps which are difficult to protect from snow and ice, can be less safe and comfortable to use. A ramp can sometimes be built into an existing structure such as a garage allowing connection directly from the floor of a vehicle to the entry level of a home.

Where elevators, wheelchair lifts or passenger lifts are required, they should be located either under cover or in an enclosed structure.

3.0 The Interior of the House

3.1 Entry and Circulation

Barrier-free design is essential to enable people to move comfortably and easily into all or most areas of a home including hallways and doorways and to ensure safe access to important spaces such as kitchens and bathrooms.

Vestibules must be large enough to allow wheelchair or walker users to move easily with adequate clearances. Immediately inside the vestibule, a foyer or other entrance space should be large enough to greet guests and to put on or remove outdoor clothing. Floor surfaces in the homes of wheelchair or walker users should be relatively smooth, but with good traction.

3.2 The Kitchen

For ambulant seniors, kitchens require only modest inexpensive changes. These might be as simple as labelling containers with larger letters for those with poor vision or manual dexterity problems, changing appliance controls, or installing taps, door handles and drawer pulls which are easier to grasp.

Changes in kitchen design to accommodate wheelchairs or walkers are more extensive. Such changes include enlarged doorways or modified door arrangements, increased clearances between counters, lower counter heights and appliances, and installation of aids which make it easier to use or reach things from a wheelchair or walker.

3.3 The Bathroom

The bathroom, one of the most important rooms for seniors, requires special design attention to ensure adequate safety, security and convenience for wheelchair users. Changes may include widening circulation access to the bathroom; providing sufficient clearances to move around within the room itself, adequate space to use the sink, toilet and bath, as well as lighting and other aids and appliances to make the bathroom safe and comfortable.

3.4 Emergency Call Systems, Security Controls and Electronic Communications

For seniors, emergency systems can be essential to summon help when difficulties arise. This means being able to rapidly summon neighbours or a telephone-based life-aid monitoring service. A variety of electronic alert devices are available to provide such assistance. These include cordless telephones or even conventional telephones with a variety of modifications to improve convenience and security for seniors.

In addition to emergency services or devices, some seniors with difficulties require a number of electro-mechanical systems to assist in a number of routine physical tasks; including opening doors or windows, controlling temperature, air circulation or humidity, as well as equipment such as radio, T.V. or kitchen appliances.

Although most security and control systems do not require major physical changes to the home, it is important that they be considered in the planning and design of changes to adapt a home for seniors' needs.

4.0 Execution of Work

4.1 Zoning, Building Laws and Regulations

It is important to emsure that all legal requirements including laws and public regulations are satisfied when construction changes are contemplated. Further, note that in most municipalities a building permit will be required and normally involves a small fee.

4.2 Design

For homes in which major changes are contemplated, it is important to ensure that design and construction documents are prepared by qualified professionals such as architects. For minor modifications, details can be drawn up and prepared by qualified technicians although in all cases design and construction must meet building code requirements.

4.3 Construction

Once drawings and specifications for the work are completed and code requirements are met depending on skills and inclinations, homeowners have several choices including (1) retaining a general contractor; (2) having a home renovation firm do the work; (3) acting as their own contractor; or (4) doing the work themselves or through others within their family.

4.4 Hiring a Contractor

If a contractor is hired there are at least seven cautions to be considered:

(1) Obtain alternate quotes

(2) Check on Contractor competence.

(3) Establish a written agreement.

(4) Pay no money until the project has started.

(5) Pay only for work completed and holdback lien monies in trust.

(6) Ensure contractor is adequately insured.

(7) Use local labour and materials as far as possible, particularly in rural areas.

ANNOTATED BIBLIOGRAPHY

Alberta Educational Communications Corporation in cooperation with Alberta Advanced Education and Manpower, 1983. An Information Guide for Design for Independence. Access Alberta, Edmonton.

This guide provides an outline of contact persons available for physically impaired persons in Alberta, 41 pages.

Alberta Senior Citizens Secretariat. 1987. Programs for Seniors. The Interdepartmental Committee on Senior Citizens, Edmonton. 38 pages.

This publication describes programs and services provided by the federal and provincial governments which address the needs of seniors.

Canada Mortgage and Housing Corporation. 1970. Housing the Elderly: Design of the Unit. First Edition (Imperial). Central Mortgage and Housing Corporation, Ottawa.

_____ 1983. Housing the Elderly: Design of the Unit. Reprint. Reprint (Metric). CMHC, Ottawa.

This is an advisory document dealing with desirable standards of housing designed specifically for elderly persons who are sufficiently healthy and mobile to live independently in self-contained dwelling units. Its purpose is to assist those intending to organize finance, design or building housing for seniors.

_____ 1982. Housing Disabled Persons. Reprint. CMHC, Ottawa.

This revised and reprinted version of an earlier 1974 manual, entitled Housing the Handicapped provides plans, specifications and diagrams which can be used as a reference by doctors, physiotherapists, work therapists, social workers and health care designers as well as the general public.

Canada Public Works. 1985. Barrier-free Design: Access To and Use of Buildings by Physically Disabled People. Design Construction, Technology Division, Sir Charles Tupper Building, Ottawa. 37 pages.

Cary, Jane Randolf. 1978. How to Create Interiors for the Disabled A Guidebook for Family and Friends. Pantheon Books, New York, 127 pages.

This guidebook provides a great deal of useful information about techniques and equipment which can

assist disabled persons in their homes. As the author notes "Although this book is about the disabled, it is for the non-disabled: the family and friends who must do whatever they can with whatever resources they have to make everyday places more comfortable, more accessible to the one who is disabled.

Cluff A.W. and P.J. Cluff. 1979. Nursing Homes and Hostels with Care Services for the Elderly: Design Guidelines. Canada Mortgage and Housing Corporation, Ottawa, 95 pages.

The main purpose of this document, which is a compendium of information from various sources, is to provide the elements of good design for residential care facilities for seniors.

Doherty, E.A. 1984. Home Maintenance and Repair: A Reference Manual for Homeowners. Alberta Department of Housing, Edmonton.

This is a Homeowners manual designed to assist Alberta's single family homeowners in the maintenance and upgrading of their homes and to assist in establishing priorities for home maintenance and upgrading.

Gutman, Gloria and Norman Blackie. 1986. Aging in Place: Housing Adaptaptions and Options for Remaining in the Community. The Gerontology Research Centre, Simon Frazer University, Burnaby, British Columbia. 156 pages.

This volume represents a series of papers which derived from two symposia held in conjunction with the 14th Annual Meeting of the Canadian Association on Gerontology, 1985. Among other things the publication considers barrier-free and prosthetic design issues, innovative financial solutions and conditions which are anticipated for seniors in the future.

Lifeline. 1987. Personal Emergency Response Hardware and Software Systems. Information brochure available from Lifeline Systems Incorporated, Watertown, MA. U.S.A.

This brief information and sales brochure explains the function and benefits of Lifeline Emergency Response systems, their application in seniors' homes and their connection to a 24-hour monitoring centre.

Whiting, David and William Woodwark. 1985. A Senior's Home: Design for Independent Living. Alberta Department of Housing, Edmonton. 53 pages.

APPENDIX

LIST OF ALBERTA HEALTH UNIT HOME CARE MANAGERS

Name and Address	Telephone
Ms. Norma Jean Weisenburger Director of Home Care Alberta East Central Health Unit Box 550 5402 - 50 Avenue Stettler, Alberta T0C 2L0	742-4461
Ms. Muriel Nelson Home Care Manager Alberta West Central Health Unit Provincial Building Box 1718 5003 - 3 Avenue Edson, Alberta T0E 0P0	723-4421
Mrs. Dorothy Patry Manager, Coordinated Home Care Program Athabasca Health Unit Box 1140 3401 - 48 Avenue Athabasca, Alberta T0G 0B0	675-2231
Mrs. Brenda Marin Home Care Manager Banff National Park Health Unit Box 1266 Banff High School Building Banff, Alberta T0L 0C0	762-2990
Miss Helen Dueck Home Care Manager Barons-Eureka-Warner Health Unit Box 1000 2012 - 18 Street Coaldale, Alberta T0K 0K0	327-6507

Mrs. Muriel Dyck
Home Care Manager
Big Country Health Unit
Box 279
402 Center Street
New Proviincial Building
Hanna, Alberta
T0J 1P0 854-3325

Ms. Dawn Wigmore
Director of Home Care
Calgary Health Services
320 - 17 Avenue, S.W.
P.O. Box 4016, Station "C"
Calgary, Alberta
T2T 5T1 228-7480

Mrs. Lorraine Larson
Home Care Supervisor
Chinook Health Unit
Box 727
521 - 26 Street
Fort Macleod, Alberta
T0L 0Z0 553-4451

Mrs. Connie Cook
Supervisor of Home Care
City of Lethbridge Health Unit
801 - 1 Street, Avenue South
Lethbridge,Alberta
T1J 4L5 327-2166

Ms. Grace Keller
Home Care Manager
Drumheller Health Unit
Box 1780
6 Avenue & 7 Street, E.
Drumheller, Alberta
T0J 0Y0 823-3341

Ms. Mary McCabe
Administrator
Edmonton Board of Health
Suite 500, Plaza 124
10216 - 124 Street
Edmonton, Alberta
T5N 4A3 482-1965

Mrs. Linda Boychuk
Home Care Director, Home Care Department
Foothills Health Unit
Box 1390
High River, Alberta
T0L 1B0 652-3200

Ms. Ruby Manning
Home Care Manager
Fort McMurray Health Unit
9921 Main Street
Provincial Building
Fort McMurray, Alberta
T9H 4B4 743-3232

Ms. Deanna Hampel
Home Care Supervisor
High Level-Fort Vermilion Health Unit
Bag 400
105 Avenue & 103 Street
High Level, Alberta
T0H 1Z0

Mr. Robert Wilson
Home Care Manager
Jasper National Park Health Unit
Box 925
518 Robson Street
Jasper, Alberta
T0E 1E0 852-4759

Ms. Sharon Tell
Home Care Supervisor
Leduc-Strathcona Health Unit
2011 Brentwood Blvd.
Sherwood Park, Alberta
T8A 3X6 467-5549

Ms. Rheta Prill
Home Care Manager
Minburn-Bermilion, Alberta
T0B 4M0 853-5270

Ms. Caren Clouston
Director, Home Care Program
Mount View Health Unit
Carma Building
Suite #200, 6715 - 8th Street, N.E.
Calgary, Alberta
T2E 7H7 275-2286

Ms. Christina Kuryliw
Home Care Director
North Eastern Alberta Health Unit
P.O. Box 1468
St. Paul, Alberta
T0A 3A0 645-3396

Ms. Janice McDonald
Home Care Supervisor
Peace River Health Unit
Box 69
10015 - 98 Street
Peace River, Alberta
T0H 2X0 624-3615

Ms. Sonia Francis
Director, Coordinated Home Care Program
Red Deer Regional Health Unit
2845 Bremner Avenue
Red Deer, Alberta
T4R 1S2 341-2130

Mrs. Judy Cameron
Home Care/Rehab Program Manager
South Peace Health Unit
10320 - 99 Street
Grande Prairie, Alberta
T8V 6J4 532-4441

Ms. Lennie Kerr
Regional Home Care Coordinator
Southeastern Alberta Health Unit
770 - 1 Street, S.E.
Medicine Hat, Alberta
T1A 0B4 527-1166

Ms. Judy Tait
Manager
Stony Plain-Lac Ste. Anne Health Unit
Provincial Building, Box 210
4905 - 47 Avenue
Stony Plain, Alberta
T0E 2G0 963-3366

Ms. Carol Sims
Director of Home Care
Sturgeon Health Unit
Box 174
23 Sir Winston Churchill Avenue
St. Albert, Alberta
T8N 1N3 459-6671

Mrs. Gloria Leraand
Supervisor, Home Care Program
Vegreville Health Unit
5431 - 50 Avenue
Husky Plaza Mall, Hwy. 16
Vegreville, Alberta
T0B 4L0 632-3331

Ms. A.J. Finseth
A/Home Care Supervisor
Wetoka Health Unit
5610 - 40 Avenue
Wetaskiwin, Alberta
T9A 3E4 352-3337